Automotive industries.
834

THE AUTOMOBILE

WEEKLY NEW YORK—THURSDAY, APRIL 2, 1908—CHICAGO 10 CENTS

Not a Single "Talking Point!"

Goodrich Tires are not sold entirely on the strength of their Tread;—their Size;—their Speed;—their Durability;—or their method of Attachment

Goodrich Tires

Excel at ALL Points

TREAD: The Goodrich Tread is justly famous for two things: It is the toughest known tread. It won't come off. Its toughness is due to Goodrich quality, Goodrich formula, Goodrich method of curing, the Goodrich "know how." It won't, and can't, come off, because it is an integral part of the casing—not cemented to it.

SIZE: Goodrich Tires are neither under nor over size, they are always standard as specified; right, for the weight they bear and the rim they fit.

SPEED: Goodrich Tires are and have always been fast tires; they are as lively as is consistent with good traction. Their record tells how fast that is.

DURABILITY: The Goodrich record for durability has never been equaled in this, or any other country. The outcome of almost every important road test for 1907 is an invitation to specify a Goodrich equipment [illegible].

ATTACHMENT: Here again is a "talking point" which alone would make a reputation. The Goodrich Quick Detachable Rim is at once the simplest, quickest, strongest and safest attachment yet [illegible] three successive years it has proved its superiority to its more complicated competitors.

Not a Single "Talking Point"—

Five of Them!

THE B. F. GOODRICH COMPANY, Akron, Ohio

CHICAGO—24 East Lake St.
PHILADELPHIA—1332 Arch St.
BOSTON—161 Columbus Ave.
SEATTLE—310 First Ave., South.
DETROIT—266 Jefferson Ave.
CLEVELAND—2188 Ninth St., S. E.
ST. LOUIS—3926-28 Olive St.
LONDON—7 Snow Hill, E. C.
DENVER—1536 Glenarm St.
SAN FRANCISCO—50-60 Fremont St.
LOS ANGELES—818 South Broadway.
PARIS—No. 2 Rue Brunel, Avenue de la Grande Armee.

Our Products are also handled in
NEW YORK, 66-68 Reade Street. BUFFALO, 731 Main Street.
By the B. F. GOODRICH COMPANY, OF NEW YORK

Our Goodrich Solid Rubber Tires started in the lead fifteen years ago and have held their own ever since

OHIO STATE UNIVERSITY

TL1*
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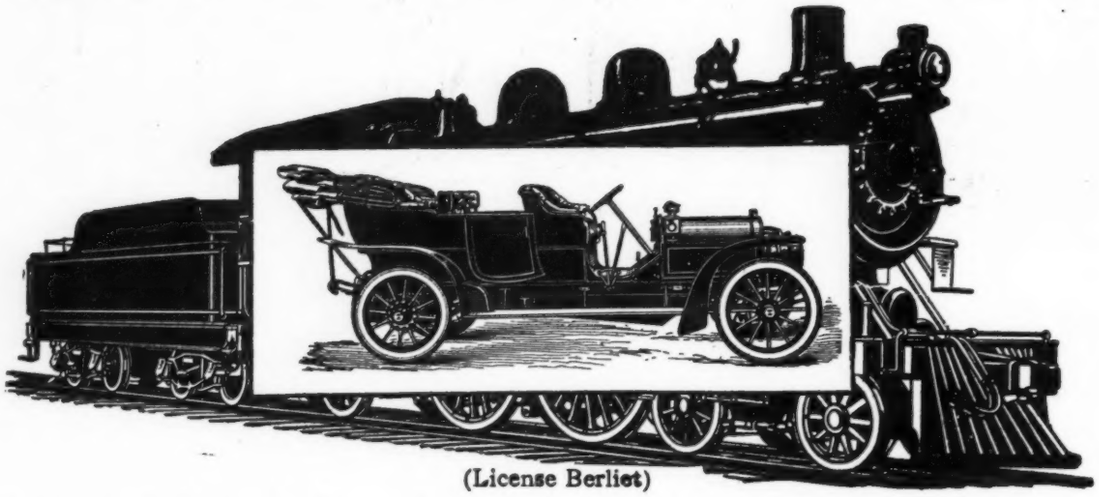
American Locomotive Motor Car



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Imported Materials. American Workmanship.
An ideal worked out to practicality and success.
A composite of superiorities. Users say: "It Stays New"

AMERICAN LOCOMOTIVE AUTOMOBILE COMPANY

FACTORY, PROVIDENCE, R. I. **1886 BROADWAY, NEW YORK CITY**

"SPECIAL"

"OFFSET"

"ROUND"

The Justly CELEBRATED 8-Day, High-Grade

"CHELSEA" AUTO CLOCK

(Trade Mark)

Clocks built with a view to stand the jars and jolts and rough riding of Automobiles. Reputation the highest. Used by parties demanding the BEST.

ALL SIZES STATED ARE THE APPROXIMATE DIAMETERS OF THE DIALS

All are 8-day High Grade. All are in DUPLEX (patent applied for) polished cast brass cases, the most thoroughly water-proof case on the market. The "SPECIAL" clocks show dial on an angle; its inner cased clock when removed from outer (locked) case is excellent for use on mantels, bureaus, etc., when touring; its outer case is screwed to dashboard by hidden screws. The "SPECIAL" clocks are in large demand from dealers for owners of finest cars.

The MOTOR CLOCK has the same clock movement which for years we have supplied for the hard use on Locomotives, Steam Fire Engines, etc.; its dial is of same appearance as the Auto Clock dial, but the Auto Clock movement has a somewhat finer train.

The 3½ MOTOR "OFFSET" is likely to prove a quick, ready seller. Very attractive.

"Chelsea"

SIZE	"ROUND"	"OFFSET"	"SPECIAL"	"LIMOUSINE"
	PRICE LIST			
2¾-inch Auto Clock	$26.00	$28.00	$36.00	$28.50
3½-inch Auto Clock	28.00	30.00	45.00	Only made in 2¾-inch size in Limousine style
3½-inch Motor Clock	24.00	26.00	41.00	

YOU want the BEST? **CHELSEA CLOCK CO., 16 State St., BOSTON, U. S. A.** Ask for the "CHELSEA"

Largest makers in America of exclusively 8-Day—High Grade Clocks; —Mantel, Marine, Office, Ship's Bell Clocks, Auto Clocks, etc.

"LIMOUSINE"

Primarily intended for use inside the bodies of large enclosed cars, and for such use its case can be given a variety of fine finishes. It also makes an attractive clock for use on dashboards. Only made in 2¾-inch size.

VOL. XVIII NEW YORK—THURSDAY, APRIL 2, 1908—CHICAGO No. 14

THE AUTOMOBILE

AMERICAN LEADER NOW ON ITS WAY TO ALASKA

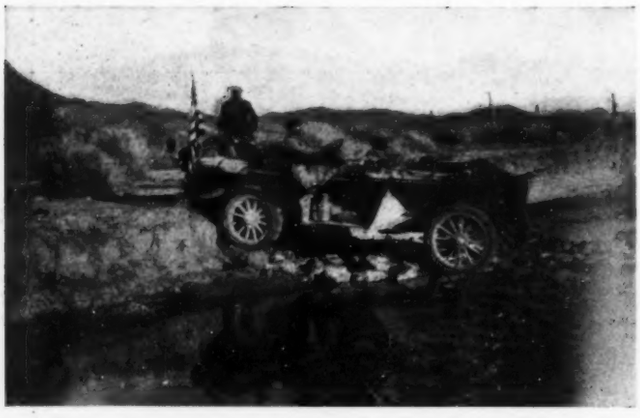
SEATTLE, WASH., March 31.—If it had not been for the seventy cars lined up on the steamship pier, waiting to act as a special escort to the Thomas, it would have seemed as if the American leader in the Paris-New York race were the first and only automobile that the inhabitants of this city had ever had an opportunity to see. Nothing brought home so strikingly to the observer the fact that the West is taking the event with the greatest interest, as the reception that the Thomas crew received on its arrival here. It was one thing for San Francisco to go wild over the Thomas, because it rolled into that city's midst right over the road it had been traveling for almost 4,000 miles, whereas here the car was hoisted out of the hold of the steamer *City of Pueblo*.

But that made no difference to the huge crowds that assembled along the waterfront two hours before the steamer was due. As soon as the tires touched the dock and the chain slings were removed the car was mobbed by autograph cranks, who wished to scribble their names all over it, so that it was some time before the crew could get near enough to start. To do so, they had to shake hands with every one who could get close enough. Finally the Thomas, with Schuester at the wheel, led the procession through the streets, which were so packed that traffic was completely demoralized for the time being. After the parade, the Thomas was taken to a garage to be given a final rubdown before being shipped on the *Santa Clara*, which leaves for Valdez, Alaska, to-morrow. Similar scenes of enthusiasm were enacted on the occasion of the car's departure, and the Thomas, with its crew, received a truly Western send-off and God-speed on their long journey. The *Santa Clara* is due at Valdez on April 6.

Seattle is the chief winter resort of Alaskans, and men who know the country that the cars will have to traverse are here in plenty at this time of the year. Their opinions of how far the Thomas will get out of Valdez would hardly be called encouraging, and are remarkable for the unanimity, only differing slightly on the mileage question. Many are quite certain that one

The Thomas Globe Girdler Among the Current Creek Mountains, Utah, Where the Sage Brush Is Luxuriant.

CANCELLED



Crossing a Rocky Ditch Where Differential Broke.

mile will mark the end of the journey, while it is conceded that ten miles out of Valdez will be a world's record. Charles H. Hamilton came from Fairbanks to Valdez early in February, over the same trail that the Thomas is to take, and is probably best qualified to speak. "There's no crust on Alaska snow," he says, "and it won't hold a man except on snowshoes, and the trail, or so-called post-road, is only 42 inches wide, while 10 miles beyond Valdez is Keystone cañon, where the trail narrows to 30 inches, so what is your 56-inch wide automobile going to do? Outside of the trail is nothing but snow, anywhere from 6 to 26 feet deep. At times the Delta river has three or four feet of water over the ice even in the coldest weather, so that you can't depend upon that."

Zust Enthusiastically Received at Los Angeles.

Los Angeles, Cal., March 31.—Upon their arrival here last night, the Italian crew were fairly mobbed by their countrymen, who showered them with oranges and flowers, and tried to drown them in champagne. The official welcome was tendered by Consul Giacomini and a large delegation from the Italian Club. From Cajen Pass, 70 miles out, where they were met by Capt. S. C. Ryus, the run was made in good time until within a few miles of the city, when a stump burst the gasoline tank. They were able to reach here without assistance, despite the accident, and ran the car to the White garage for repairs.

The De Dion reached Tonopah to-day, where it was met by a special reception committee from Goldfield, and requested to make its entry into the latter place in the afternoon. The Frenchmen complied, and found that a reception and ball had been prepared in their honor. The De Dion crew has been making up for lost time, as the 250 miles of desert from Ely to Tonopah were made in 13 hours, or a day and a half less than the Thomas required. The Protos is struggling between Granger and Evanston, Wyo., and is having a very much harder time of it than the other cars, owing to the recent thaws.

Indians at White River, Nev., Interested in Car.

A STATEMENT FROM THOMAS COMPANY.

From the E. R. Thomas Motor Company comes this emphatic statement, signed by its president:

While many competitors are fair and realize our victory benefits the whole American industry, certain knockers, to boost their sales and injure ours, have made false and malicious statements that the Thomas Flyer was not a stock car, that cylinders were changed, and that the car was necessarily rebuilt during the race. We hereby notify them that their statements are false and malicious and must cease, or they will be prosecuted to the fullest extent of the law. We make the following statement in order that our friends and the public may know the truth, and we offer $1,000 reward for proof to the contrary:

We hereby certify that the Thomas Flyer in the New York-to-Paris race is absolutely an ordinary stock car, selected only six days before the race, and was not specially prepared or tested. Furthermore, it is identical in motor, clutch, driving shaft, radiator, carbureter, transmission gears, frame, wheels, bearings, and in all other essential features of its mechanism now in use by Thomas owners.

We also certify that the Thomas Flyer ran from New York to Cheyenne, a distance of 2,028 miles, almost entirely over roads made practically impassable by snow and mud, climbing mountains, plunging through ruts, and fording streams without overheating once; without repair or replacements of cylinders, spark plugs, transmission, radiator, bearings, clutch, carbureter, or other mechanical parts. In fact, the only breakage was two chain links, easily replaced, and a sprocket housing.

Detailed reports beyond have not been received, but telegraphic reports state repairs were insignificant and that the car arrived in

Starting Out from Tonopah, the Miners' Paradise.

San Francisco in splendid condition, ready to proceed on the long journey, a feat unparalleled in the history of automobiles—the longest and severest endurance contest in the history of the world, and one that makes the Glidden tour on well traveled roads, between large cities, pale into insignificance by comparison. The Thomas was only entered because we believed it to be a reflection on the American industry to have five foreign cars carry five foreign flags across the American continent without an American car contesting for American supremacy.

(Signed) E. R. THOMAS MOTOR COMPANY,
By EDWIN ROSS THOMAS, President.

A. C. C. OF N. J. ELECT POST PRESIDENT

Trenton, N. J., March 31.—The annual meeting of the board of directors of the Associated Automobile Clubs of New Jersey was held here this afternoon. Wilbur F. Sadler, Jr., of this city, declined another term as president, and George A. Post, of Paterson, was elected to succeed him. Other officers chosen were: W. C. Crosby, Newark, first vice-president; Walter E. Edge, Atlantic City, second vice-president; H. A. Bonnell, Newark, secretary and treasurer. The report of President Sadler showed that during the past year the membership of the association had doubled. The directors passed a resolution indorsing a bill introduced in Congress providing for the erection of a bridge over Newark Bay, and a bill pending in the Legislature which authorizes Freeholders to issue bonds for the repair and betterment of roads.

Thomas Coming Round the Turn Near Corinne, Utah.

Crossing a Mountain Range in Nevada.

HOW MONTAGUE ROBERTS TOLD HIS STORY.

AT the recent banquet of the Yale Automobile Club, held at New Haven, Montague Roberts was one of the guests.

"I can tell you a few things about the price of teams, and pancakes, and how it feels to be scared to death by a cowpuncher," he began. "That trip to Cheyenne was a pretty tough one, but the Harry S. Houpt company and I were too patriotic to allow any race to be run off without an American car being represented, and so when the Thomas was entered I agreed to pilot it.

"The time for me to run the machine was limited to four weeks, on account of my engagement at Briarcliff and in the Grand Prix races. After the Briarcliff races—if I don't kill myself—I shall start for France, and later take the American racer again in Siberia.

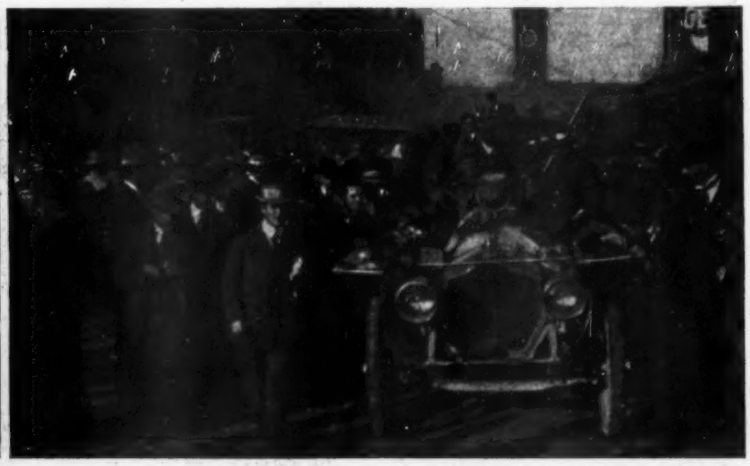
"Well, after we left New York, the snow wasn't so bad until we got to Albany. There we had to take the Erie towpath to Syracuse, where we again took to the roads as far as Buffalo. I've had dealings with farmers—I was born in Pittsburg myself—but never such dealings as I had from Buffalo on. We bucked the snowdrifts straight through to Toledo, and from there on—well, I never thought there was as much snow in the skies. Just beyond Toledo we put the car up in the village livery stable and went into a little country store to warm up. I started to wrestle with one of the boys to get my blood circulating and accidentally put my elbow through a showcase. Then the lady put me out. All the fellows followed, and we struck out for the next town. Honestly, it took us 14 hours to go 17 miles the next day, and then I was arrested for cutting down a wire fence and forced to pay $15 in settlement. In the next town we landed in more snow, and it cost $102 to hire four more teams to haul us out.

"In one place where we were stuck, we hired a 12-horse sled and hauled the car up on it. The car slid off into a ditch and pulled two horses in with it. It took three hours to get the car and horses out again, and some warm arguments with the teamsters regarding the cost followed. We ran the next 23 miles over the railroad ties. It wasn't so bad bumping the rails; but those thundering 'frogs' gave us a great time as we drew near Chicago. In Chicago we put on a new set of tires. It took the next two days to run 190 miles and we ruined the set. In northern Iowa the 'gumbo' mud, as they call it there, averaged anywhere from two inches to a foot deep all the while. Honestly, you'd have to help the car down hill at full speed. The sandy hills of Nebraska came next. There are no roads there—just a lot of ranches. I always had a longing to see a real cowpuncher. I've had a horse of my own, and now I've got a pair of those pants with the fuzz all down the side of 'em. They were given me by the Cheyenne Auto Club.

"Well, I met a cowpuncher near there. We were driving along at dusk, when I heard the sound of horse's hoofs behind, and then a yell. I looked around and saw one of them dashing down the line. I took out my own gun, as I did not know whether there was going to be something doing or not. He galloped up alongside, and I waited for something exciting to happen. To my surprise, he pulled out a little bunch of flowers, wrapped up in a small American flag, and said: 'Here, boys, plant these here colors in Paris. Luck be with you—go ahead!'

"At Cheyenne, the Thomas car had a lead of 516 miles. I made the driver who took my place promise to hold that lead, and I assure you that nobody will try to get a car to Paris more than the Thomas people."

On the Ferry from Oakland to San Francisco.



Arrival of the Thomas on Market Street, San Francisco.

Finish of the 500-miles Trial of the Reassembled Cadillacs at Brooklands Track, England.

BRITISH SUCCESS OF CADILLAC CARS.

LONDON, March 19.—A trio of Cadillac cars have just successfully emerged from a most severe test of standardization at the hands of the Royal Automobile Club. These popular cars are noted on this side for their reliability, and it was in order to establish an equally strong reputation for their parts standardization that F. S. Bennett, the manager of the English branch, proposed the present test.

Two members of the trials committee of the club visited the Cadillac sales depot and selected three 10-horsepower cars at random out of the stock. These were run under observation to Brooklands and straightway driven round the track for 50 miles. At the end of this preliminary jaunt the cars were taken to pieces and in three compartments of the Brooklands garage were to be seen three heaps each composed of 721 separate pieces of a 10-horsepower Cadillac. From these the judges selected at random the parts necessary for the rebuilding of the three cars, and, to show the practical utility of the standardization system, no less than 90 parts were picked out and ordered to be replaced by spare parts from the London stores. The reerection was successfully completed in quick time, the engine of the first car being started and ready to run the car round the track in 7 1-2 hours from the commencement.

On the two following days the three cars were run a distance of 500 miles each, the average speed for the three being 34 miles per hour and the maximum speed 39 miles per hour. The whole distance was completed without a single mechanical stop. Since this test the cars have been taken charge of by the Royal Automobile Club, and when the date of the 2,000 miles reliability trial arrives, one of the cars will be chosen by the judges to run through the trial without any preparation.

LOCOMOBILE WINS RECORD CUP CONTEST.

MEXICO CITY, March 20.—In the race for the cup offered by the Mexico *Daily Record,* a 40-horsepower Locomobile driven by J. L. Lawrence, for the Compania Mexicana de Vehiculos Electricos made the round trip between the Country club in Chirubusco and Cuerravaca, in 3:21 flat, beating a Thomas, driven by Leandro Cuevas, by 21 minutes. Owing to the narrow roads and their crowded condition, the contestants ran over the course on different days. Considering the condition of the route, which is very hilly, and the fact that it was very crowded for a greater part of the way with peones on the way to market from Morelos, the speed made was remarkable, quite a few stretches being done at 60 miles an hour and better. No tire trouble was encountered, and but five minutes were lost in replenishing the radiator, this being the only stop on the trip aside from those necessary to avoid pedestrians and burros.

HOTCHKISS TALKS TO THE CANADIANS.

TORONTO, ONT., March 28.—The annual dinner of the Ontario Motor League, held last night, was a notable affair. One of the principal speakers was President William H. Hotchkiss, of the American Automobile Association, whose remarks found much favor with those present, for the reason that just now the Canadians are experiencing some very annoying forms of drastic legislation which they hope to have modified.

Duncan McDonald, president of the Automobile Club of Canada; U. H. Dandurand, vice-president of the Ontario Motor League; Mayor Oliver, E. B. Ryckman, K.C.; Dr. Godfrey, M.P.P.; Lloyd Harris, and William Stone were among the other speakers who addressed the gathering.

Committee of the Royal Automobile Club Mixing the Parts of the Three Cadillacs, and Handing Out Set for No. 1 Car.

GRAND PRIX PLANS ARE NOW WELL UNDER WAY

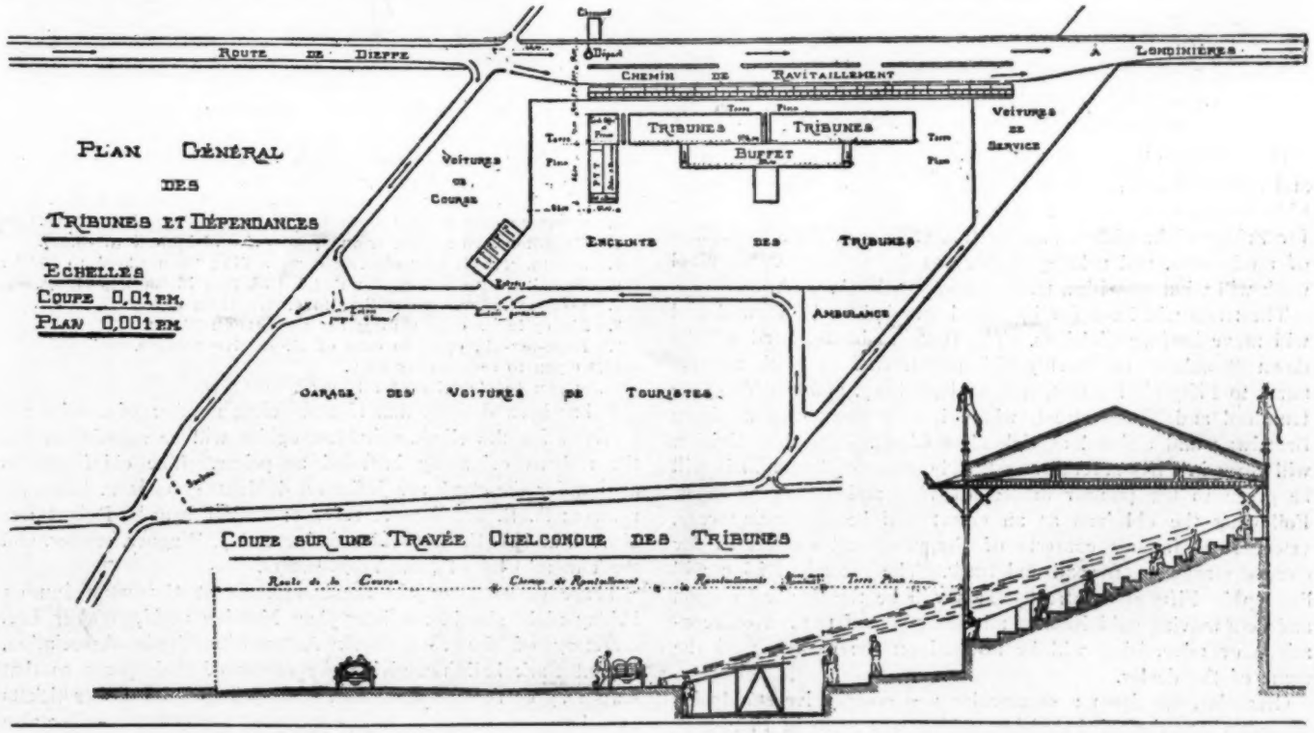
PARIS, March 28.—After considering several schemes the Automobile Club of France has decided on a form of grandstand for the Grand Prix differing from any adopted heretofore. The main stand and everything connected with it is on the outside of the course about half a mile from the Dieppe hairpin turn. On the inside of the course is nothing but the starter's box and the scoreboard, this latter being a long, low placard, its highest point less than three yards from the ground. Opposite the grandstands the road has been made double width, the inner half being reserved for cars running in for tires, gasoline, or other provisions. A long, shallow pit has been built the full length of the inner road, and it is in here that the gasoline and tire stations will be established. Behind this row of boxes is a passage communicating with the entrance to each stand. The grandstands proper commence some distance from the tire stations and rise up at such an angle as to allow a perfect view from every row. The general arrangement recalls forcibly that of Madison Square Garden for the six-day bicycle race; the circular passage between the spectators' seats and the track, in this case, being the tire and gasoline stations. At one end of the grandstand will be a high tower, one story of which will be reserved for notables and the other to members of the press, telegraph connection being brought into the rear of the press room. Behind the main buildings will be the garages.

Being on the outside of the course access to and from the grandstands will be possible at all hours, even the main road from Dieppe can be kept open until a quarter of an hour after the start. Should it be considered necessary the racers will be started from the inner half of the road leaving the main portion of the course free for the passage of cars finishing the first round and passing at speed. As each machine must cut in for stoppages to take on gasoline and change tires the full width of the road opposite the grandstands will never be encroached upon for this purpose.

Racing drivers are already active on the Dieppe course, and so great has been the rush of automobiles to the Dieppe triangle that the police have had to take special measures to enforce the speed regulations in all villages. Panhard, Brasier, Bayard-Clement, and Renault have been among those putting in a large amount of time during the past week. The three Renault racers now out have a close resemblance externally to those of last year. The four cylinders, cast in pairs, are 155 millimeters bore by 160 millimeters stroke, which is rather less than the majority of French cars constructed for the Grand Prix. Valves are all on one side, operated by a single camshaft. The engine is cooled on the thermo-siphon system, with multi-tubular radiator behind the engine, according to general Renault practice. There are three speeds forward by progressive sliding gear, shaft drive, and according to the driver's declaration, no differential. It will be remembered that the Renault which captured the first Grand Prix was also without differential.

An idea of the effort that is being made by Mercedes to recapture speed laurels may be judged from the fact that ten racing cars are being built, three of which are already on the road. In general lines there is nothing which distinguishes them from last year's models. The engine is declared to have the maximum bore and a stroke of 170 millimeters. Low tension magneto is employed with Bosch magneto.

Great Britain has selected an excellent team of racing drivers for the three Austin cars entered in the Grand Prix. Lee Guinness, the rich amateur driver, known to the world by reason of his connection with a certain brand of stout, stands forth in the automobile world as the owner of the 200-horsepower eight-cylinder Darracq, recognized as the fastest car in the world. Resta, who will handle the second car, has an excellent reputation as a driver of fast cars on Brooklands track, and Warwick Wright, the Darracq representative in England, has already won sufficient races at Brooklands and on the road for him to be considered the equal of any of the Continental drivers. Weigel, who drove his own car in the last Grand Prix, will be a spectator this year, the withdrawal of his license making it impossible for him to handle a car in his own country. The only driver who has been definitely selected is Coleman, an automobilist little known outside of home circles.



Grand Stand Arrangement for the Grand Prix—Upper Design Shows Floor Plan—Lower Design Shows Side Elevation of Stand.

FATHER KNICKERBOCKER SEEMS KEEN FOR THE CARNIVAL

EVERYTHING is now in readiness for next week's carnival in New York City to celebrate the tenth trade birthday of the automobile in this country and to formally open the selling season of 1908. Indications point to an automobile function far greater in magnitude than the most sanguine of its promoters of the New York Automobile Trade Association ever expected. Already "Automobile Row" is beginning to take on its holiday dress of bunting and carnival flags. Letters are pouring in on the dealers telling them of the intention of the writers to make a week of it in New York. Whether the big selling counted on occurs during opening or at a later week, the New York tradesmen are well satisfied that they will have given automobiling locally a big and beneficial boom at a time when some weak-kneed ones were a bit shaky over trade prospects.

Carnival week will be marked by four specially scheduled features, three of them taking place at night so as not to interfere with the examination and purchase of cars, which will be one of the main objects of many of the visitors to town.

A Practice Trial by a Rambler on Fort George Hill, where Carnival Event Will Take Place.

On Tuesday night there will be a monster parade of illuminated and decorated cars. Thursday will be given over to a series of hill climbing contests at Fort George. A joy ride is scheduled for Friday night with Gramatan Inn, at Bronxville, as the place of rendezvous, and a banquet there as the attraction. Carnival week will wind up with a trade smoker at the A. C. A.

The trade will have for its grand marshal R. G. Howell and will move in four divisions. The route to be followed will be down Broadway to Twenty-fifth street, east to Fifth avenue, north to Fifty-ninth street, west to Broadway, and north to One Hundred and Tenth street, where it will countermarch down Broadway and disband at Columbus Circle. The first division will form in Fifty-seventh street. The place of honor in it will be given to the pioneer models of 1903 and earlier vintages. Following the old 'uns as an escort will be the racing cars, veterans of famous contests of the past, and candidates for coming struggles on road and track. The second division will line up in Fifty-sixth street. This will be the dealers' section and be a moving exhibition of all the models of 1908. No decorations or advertising will be allowed on the cars beyond the name of the dealer.

Great interest from a spectacular and competitive standpoint will attach to the third division, which will form in Fifty-fifth street. It will be made up exclusively of decorated cars formally entered in competition for first and second prize trophies for artistic beauty of embellishment. A trophy will also be awarded the most grotesquely decorated car. No names, signs, or other advertising features will be permitted in this division.

A division, which promises much in the way of exploitation of the business utility of the automobile is the fourth, whose place of assemblage will be Fifty-fourth street. To it are assigned not only commercial cars of every type, but also floats for advertising purposes.

On the night of the parade Eighth and Ninth avenues will be closed between Fifty-third and Fifty-eighth streets.

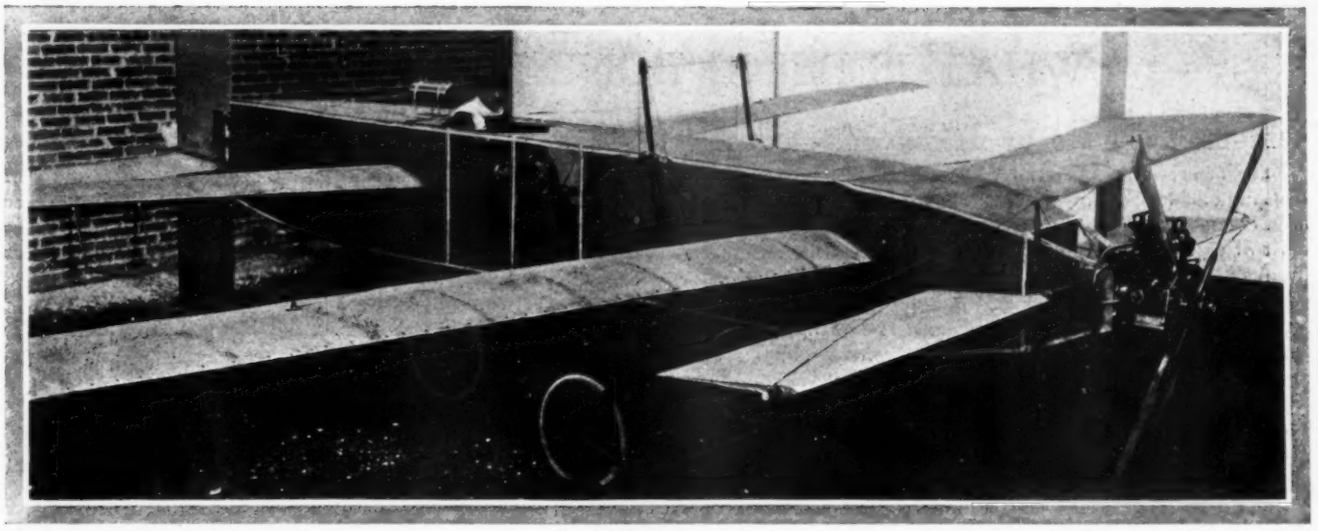
Novel judges' and reviewing stands have been conceived. They will consist of sight-seeing 'buses and touring cars parked on either side of the esplanade on Broadway between Eighty-seventh and Eighty-eighth streets facing the curbs on either side.

The hill-climb will take place at half past one o'clock on Thursday afternoon on Fort George hill, starting at Dyckman street, which has a station on the Broadway division of the subway. The program as arranged by the committee follows:

1. Gasoline cars selling for $850 or less.
2. Gasoline cars selling from $851 to, and including, $1,250.
3. Gasoline cars selling from $1,251 to, and including, $2,000.
4. Gasoline cars selling from $2,001 to, and including, $3,000.
5. Steam, gasoline or electric cars, selling from $2,001 to $3,000.
6. Gasoline cars selling from $3,000 to, and including, $4,000.
7. Four-cylinder cars selling for more than $4,000.
8. Six-cylinder cars selling for more than $4,000.
9. Free-for-all, open to cars of all motive powers.
10. Open to steam cars only.
11. Open to electrics of all types.

It has been decided that if a sufficient number of entries are received for the climb, suitable trophies will be substituted for the ribbons originally intended as prizes. The chief officers chosen for the climb are Jefferson deMont Thompson, honorary referee; A. R. Pardington, referee; C. J. Edwards, Robert Lee Morrell and A. G. Batchelder, judges; F. J. Wagner, starter, and the Timers' Club of New York, timers.

Those desiring to join the banqueters at Gramatan Inn on Friday night should not later than Monday notify Walter Lee, secretary of the New York Automobile Trade Association, Bryant Park building, giving the names of their party so that seats may be reserved together. The price of the dinner tickets have been set at $1.25. It is not a stag affair, ladies being also expected.



The New Paulham-Kaepferrer Aeroplane with Its 35-horsepower, Six-cylinder Motor and Four-bladed Propeller.

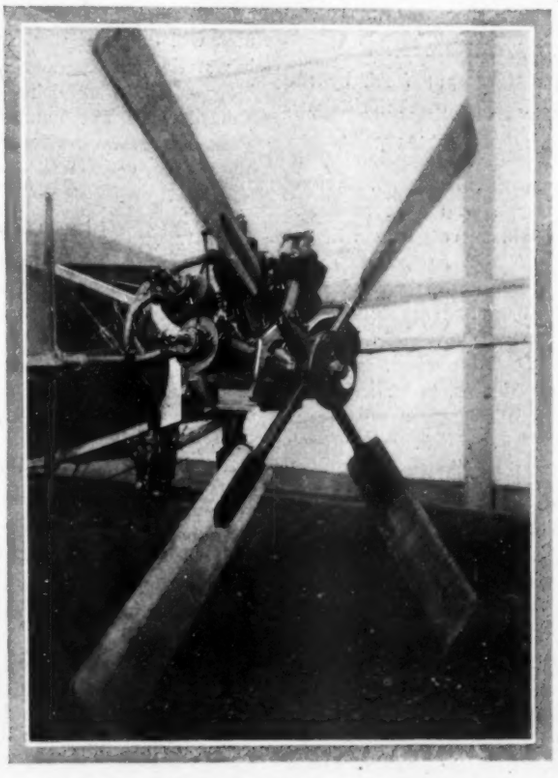
FARMAN IS STILL THE AIR CHAMPION.

PARIS, March 28.—Henry Farman is still the world's champion flyer. Since winning the Deutsch-Archdeacon prize, the Anglo-French aeronaut has been occupied almost exclusively with the rebuilding of his machine. Yesterday evening, at the Issy-les-Moulineaux ground, he made two flights of the most successful nature, the first one being over a distance of one and a half miles in 2 minutes 50 seconds, and the second over a circle estimated at 1.8 miles in 2 minutes 55 seconds. Unfortunately, the officials of the Aero Club were not present to control the flight, and, in order that all may be regular, Farman has given official notice of his intention to fly in the presence of an Aero Club delegation against his own record.

In the course of the trials, while Farman was practising circling, he gave the machine too much inclination, and, as the machine was close to the ground, one of the wings struck the ground while going at a good rate of speed and threw the inventor out. He left some of the skin of his nose and forehead on the ground, but was otherwise unhurt.

An Appeal for Prizes.

PARIS, March 28.—Ernest Archdeacon, who, with M. Deutsch, gave the $10,000 prize recently won by Henry Farman, has made an appeal, through the Paris *Herald*, to wealthy Americans to subscribe the sum of one million francs ($200,000) for prizes to encourage the science of aviation. By offering prizes instead of spending money on personal experiments, M. Archdeacon says that fully $100,000 was expended in attempting to win the prize, and unthought-of progress was the result. He is of the opinion that there are plenty of men in America who can afford to give largely, and he may even undertake an expedition to America for that purpose. How much success he will have should he cross the ocean is considered rather problematical.



Propeller and Housing of the Paulham-Kaepferrer.

GERMAN AERONAUTIC INTEREST KEEN.

BERLIN, March 27.—German patriotism has been aroused to the extent of offering a prize of $10,000, which has been handed over to the German Aeroplane Club by Karl Lanz, a Mannheim merchant, to be contested for by machines of the heavier-than-air type. They must be constructed entirely in Germany, and of German materials. The competition will be held on the Tempelhof parade ground. Herr Lanz has also donated $2,500 to aid poor German aeroplane inventors.

Progress has been so rapid that the Aero Club has now established itself in a splendid new home at Wollendorf Platz, No. 3, the quarters comprising meeting, dining, smoking and tea rooms, beside an assembly hall, and are elaborately fitte dthroughout. The club has also taken a country house, and its members are looking forward to a most prosperous future. It is understood that the emperor is taking increased interest in aeronautical matters, and greater recognition is expected from him in future.

AERONAUT BISHOP TALKS

NEW YORK, April 1.—At the fortnightly entertainment of the Automobile Club of America, held at the clubhouse Tuesday evening, Cortland Field Bishop, president of the Aero Club of America, delivered a lecture, entitled, "Some European Highways as Seen by an Automobilist." His lecture dwelt particularly upon the value of the strategic mountain roads of the French side of the Franco-Italian frontier, and was profusely illustrated with lantern slides made from negatives taken by Mr. Bishop himself while touring the Continent. The talk was one of the most interesting that the club members have been treated to in a long while, and was enthusiastically received, as it showed in a most striking manner the tremendous amount of work that must be done in this country before America can claim to have a highway system that can be dignified by this title.

WHAT IS BEING DONE IN CLUBDOM

FIGURES FROM CLUB DYNAMOMETER TESTS.

NEW YORK CITY, April 1.—A report has just been issued by the Automobile Club of America showing the results that have been obtained in the dynamometer tests of 17 different machines, most of them being owned by members. As will be recalled the dynamometer is designed to show not only the working horsepower of a car, but also the speed in miles per hour and feet per second, according to the gear used; the hill-climbing ability, and the holding-power of the brakes. The power reading is taken at the rear wheels in contrast with the usual motor rating, which does not take account of transmission losses, usually averaging about 25 per cent.

Although the cars are tested on all speeds and on each gear, in the following tabulated results of the tests, only one speed is given. In this table, it will be noticed that some of the cars give an output at the rear wheels in excess of their rating, though the latter is, in many cases, only nominal. One of the Packard "30" 1907 models, belonging to J. M. Fiske, showed 33 horsepower, on the first speed, while G. E. Schanch's "30" Peerless also showed the same rating on this speed. The smallest car tested was a Delahaye taxicab, which is in daily service about the city. On third speed it showed an output of 5.25 horsepower. The table is as follows:

Car, H.P., and Type	Maximum H.P. at Wheels	Miles Per Hour	Gear
Mercedes, 40, runabout	29	42	4th
Pope-Hartford, 30, touring	25½	36	3d
Westinghouse, 35-40, touring	30	25½	2d
Stoddard-Dayton, 40, runabout	30	43	3d
Packard, 30, runabout	33	12	1st
Pierce Arrow, 40 (6 cyl.), touring	30	43	3d
Pierce Arrow, 28-32, touring	21½	11	1st
Simplex, 50, touring	44	46	3d
Packard, 24, limousine	20¾	13	1st
Stoddard-Dayton, 40, runabout	24	44½	3d
Oldsmobile, 35, runabout	15	34½	3d
Stevens-Duryea, 30 (6-cyl.), touring	26	40	3d
Delahaye, 8-9, landaulet	5¼	25	3d
Locomobile, 15-20, limousine	13½	7	1st
Thomas, 40, runabout	23	40	3d
Peerless, 30, touring	33	14	1st
Packard, 30, touring	35	28	2d

NOTED NAMES AMONG A. C. A. NOMINEES.

NEW YORK, March 30.—The regular ticket put forth by the nominating committee of the Automobile Club of America will give the club several new officers not hitherto connected with the management of the club. It embraces names high up in financial business and social life, whose various connections therewith are well known. The nominees, who have been approved by the board of governors and will be voted upon at the annual meeting of the club on April 14, are: President, Judge E. H. Gary; first vice-president, Henry Sanderson; second vice-president, William G. McAdoo; third vice-president, Robert Lee Morrell; treasurer, Edgar L. Marston; governors, Cornelius Vanderbilt, General Horace Porter, F. D. Underwood, W. Pierson Hamilton, Colgate Hoyt, Waldron Williams, and Dr. Schuyler S. Wheeler. The governors who will remain in office are: Winthrop E. Scarritt, Dave Hennen Morris, Col. John Jacob Astor, George F. Chamberlin, and Albert R. Shattuck.

CINCINNATIANS SECURE HOTEL CLUBROOMS.

CINCINNATI, March 30.—Permanent clubrooms have been secured on the second floor of the Gibson House for the use of the Automobile Club of Cincinnati. The recent annual election of the club resulted in the choice of the following: President, Dr. Charles L. Bonifield; first vice-president, C. Gordon Neff; second vice-president, D. McKim Cooke; secretary, Dr. L. S. Colter; treasurer, Harry L. Manss; consulting engineer, E. J. Carpenter; board of governors, G. W. Drach, Val Duttenhofer, Jr., Dr. A. B. Heyl, C. E. Bultman, Paul H. Verkamp, and Louis Merkel. The three last named are recent recruits.

$10,000 IN GUIDEPOSTS FOR CHICAGO.

CHICAGO, March 30.—Thanks to the signboard committee of the Chicago Motor Club, 1,000 miles of roads embracing eleven different routes leading from the city, are to be marked by guideposts. The cost of this great plant is estimated at from $7,000 to $10,000. Already the order for the first 1,000 signs has been placed. Most of the work will be done this summer, and when completed Chicago will have set a shining example to motordom of what can and ought to be done by the clubs, dealers, and automobilists at large of every city. The setting out of the posts and the erection of the signs will be begun by May 15. The committee counts on having at least four of the routes covered by June 1. A donation of $1,000 by the Chicago Motor Club, and of $350 by the Chicago Automobile Trade Association, added to $539 from the old signboard commission, formed the nucleus of the fund. The signs will be of cast iron and the posts of cedar, 10 feet high. The posts and the background of the signs will be painted white to contrast at night with the black letters. The metallic paint will be renewed annually.

The routes to be marked are those to South Bend, Ottawa, Rockford, Cedar Lake, Ind., Kankakee, Lake Geneva, Milwaukee, Fox Lake, and Aurora and Elgin. Members of the signboard committee, which consists of J. V. Lawrence, Harry Branstetter, E. Q. Cordner, Paul Picard, Berne Nadall, W. H. Mason, O. G. Temme, N. H. Van Sicklen, Jr., and William R. Johnson, have already marked out the location of the posts. The signs will also give warning of hills, deep cuts, turns, railroad crossings, and other danger places ahead.

FIRST RUN OF NEW PENNSYLVANIA CLUB.

PHILADELPHIA, March 30.—Many local automobilists are preparing to take part in the first annual endurance run of the Norristown Automobile Club, which is scheduled for Tuesday, April 28. The route selected, which is about 123 miles in length, will be triangular in shape, with Norristown, Lancaster, and Reading at the three corners. A total of 7 hours 15 minutes will be allowed to cover the course. There will be checking stations at Coatesville, Lancaster, Reading, Pottstown, and Norristown. The going is sufficiently varied to make the run a hard test. The Lancaster-Reading leg, 31.7 miles, for which 1 hour 55 minutes will be allowed, will furnish the hardest going, and, if the weather be wet, clean scores will be a *rara avis*.

MILL CITY AUTOMOBILISTS ORGANIZE.

FALL RIVER, Mass., March 30.—Autoists of this city and vicinity have formed the Fall River Automobile Club. The new club has secured a charter from the Secretary of State and elected its first board of officers as follows: President, Dr. George L. Richards; vice-president, Earle P. Charlton; secretary, Arthur S. Phillips; treasurer, Albert A. Harrison; directors for three years, Earle P. Charlton, Robert Marshall, John P. Hilton; directors for two years, George L. Richards, Edward B. Jennings, Edmund Cote; directors for one year, Herbert C. Talbot, George D. Flynn, and Edward B. Remington.

DEAD HORSE HILL CLIMB MAY BE REVIVED.

WORCESTER, Mass., March 30.—The governors of the Worcester Automobile Club have called a meeting to decide on a date in May, at which time the annual meeting of the club and the elections of officers for the ensuing year will be held.

It is expected that the Dead Horse Hill climb will come up for consideration and discussion at this meeting.

At this meeting will be chosen the successor of the late secretary of the club, Robert M. Pratt. I. C. Caton has been acting as secretary since Mr. Pratt's death.

GOVERNMENT TESTS ALCOHOL AND GASOLINE

THE Technologic Branch of the United States Geological Survey, under the direction of J. A. Holmes, has recently completed an elaborate series of tests on the relative value of gasoline and alcohol as producers of power. The tests, over two thousand in number, probably represent the most complete and exact investigation of the kind that has been made either in this country or abroad, and include much original research.

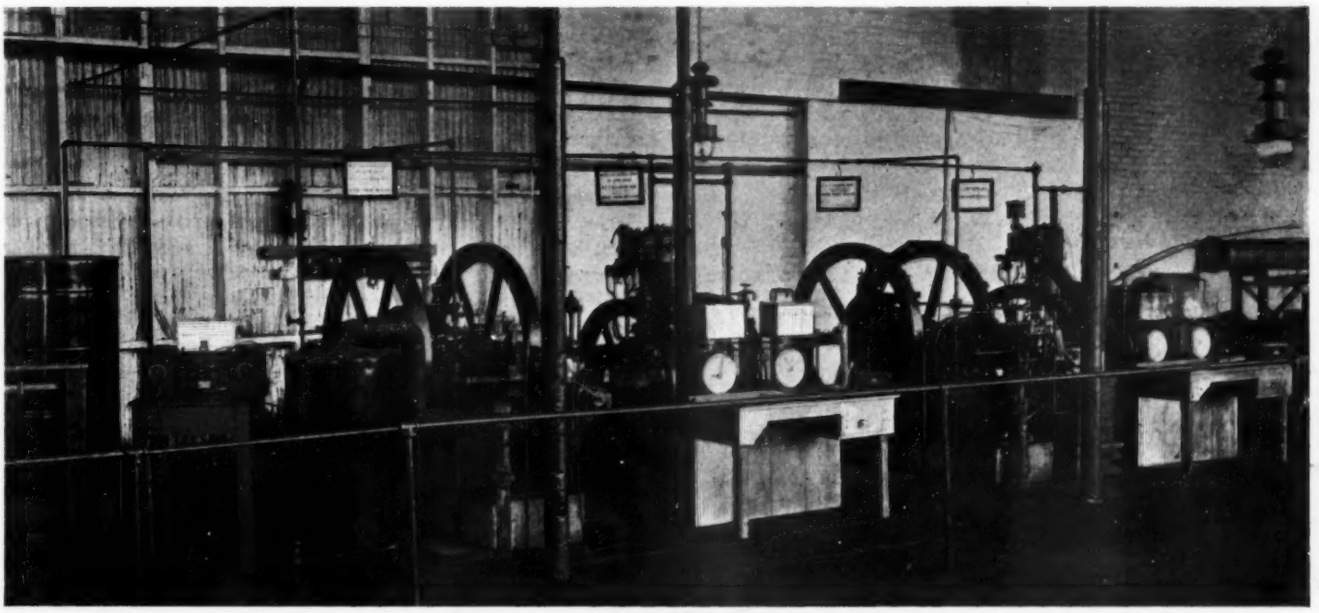
Professor R. H. Fernald, Engineer in Charge of the Gas Producer Section and professor of mechanical engineering in the Case School of Applied Science, Cleveland, O., was in general charge of the tests. R. M. Strong, formerly connected with the engineering department of Columbia University, had personal supervision of the work. He was assisted by a corps of specially trained men. These tests were conducted at the Fuel Testing Plant of the Geological Survey at Norfolk, Va., and show the following results in regard to the comparative fuel consumption of 73 degree specific gravity gasoline and commercial completely denatured alcohol, per unit of power.

Correspondingly well-designed alcohol and gasoline engines, when running under the most advantageous conditions for each, will consume equal volumes of the fuel for which they are designed. This statement is based on the results of many tests made under the most favorable practical conditions that could be obtained for the size and type of engines and fuel used. An average of the minimum fuel consumption values thus obtained gives a like figure of .8 pint per brake horsepower hour for gasoline and alcohol.

Considering that the heat value of a gallon of the denatured alcohol is only a little over .6 that of a gallon of gasoline this result of equal fuel consumption by volume for gasoline and alcohol engines probably represents the best comparative value that can be obtained for alcohol at the present time, as is also indicated by Continental practice. Though the possibility of obtaining this condition in practice here has been thoroughly demonstrated at the government Fuel-Testing plant, it yet remains for the engine manufacturers to make the "equal fuel consumption by volume" a commercial basis of comparison.

The gasoline engines that were used in these tests are representative of the standard American stationary engine types, rating at 10 to 15 horsepower, at speeds of from 250 to 300 revolutions per minute, while the alcohol engines were of similar construction and identical in size with the gasoline engines. The air was not preheated for the tests, and the engines were equipped with the ordinary types of constant level suction lift, and constant level pressure spray carbureters. Many special tests with air preheated to various temperatures up to 250 degrees Fahrenheit, and tests with special carbureters were made, but no beneficial effects traceable to better carburetion were found when the engines were handled under the special test conditions, including constant speed and best load.

The commercial completely denatured alcohol referred to is 100 parts ethyl alcohol, plus 10 parts methyl alcohol, plus .5 part benzol, and corresponds very closely to 94 per cent. by volume, or 91 per cent. by weight, grain alcohol. No detrimental effects on the cylinder walls and valves of the engines were found from the use of the denatured alcohol. The lowest consumption values were obtained with the highest compression that it was found practical to use; for the denatured alcohol, this ranged from 150 to 180 pounds per square inch above atmospheric.



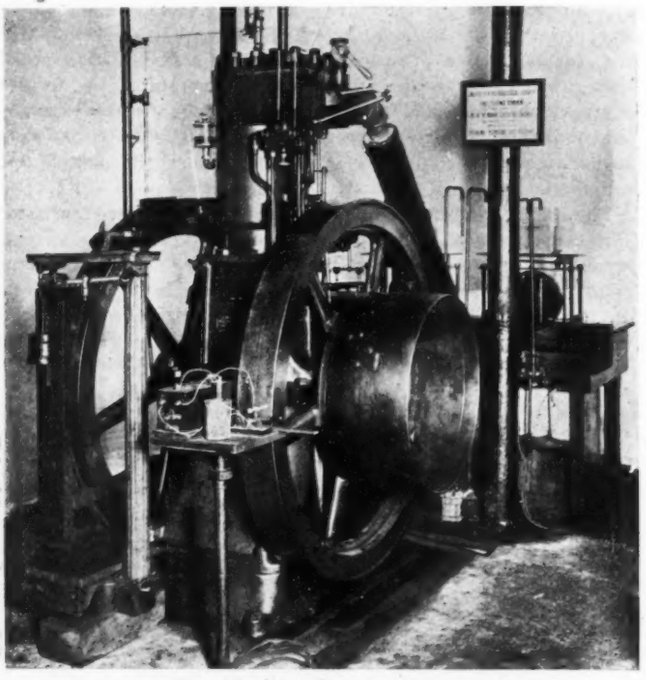
Interior View of the Government's Specially Equipped Fuel-testing Plant at Norfolk, Va.

Eighty per cent. alcohol (alcohol and water), for use in engines of the present types, would have to sell for at least 15 per cent. less per gallon than the denatured alcohol, in order to compete with it. The minimum consumption values in gallons per brake horsepower hour, for 80 per cent. alcohol, is approximately 17.5 per cent. greater than for the denatured alcohol used, or for gasoline. A series of tests made with alcohol of various percentages by volume, ranging from 94 per cent. to 50 per cent., showed that the minimum consumption values, in gallons per brake horsepower hour, increased a little more rapidly than the alcohol decreased in percentage of pure alcohol. That is, the thermal efficiency decreased with the decrease in percentage of pure alcohol. This decrease in thermal efficiency, or increase in consumption referred to for pure alcohol, is, however, comparatively slight from 100 per cent. alcohol down to about 80 per cent. alcohol. Within these limits, it may be neglected in making the calculations necessary to compare the minimum consumption values for tests with different alcohol percentages.

The purer the alcohol is, the greater the maximum horsepower of the engine. The reduction in maximum horsepower for 80 per cent. alcohol, as compared with that for denatured alcohol

used, was less than 1 per cent., but the starting and regulating difficulties are appreciably increased.

With suitable compression, mixtures of gasoline and alcohol vapors (double carbureters) gave thermal efficiencies ranging between that for gasoline (maximum 22.2 per cent.) and that for alcohol (maximum 34.6 per cent.), but in no case were they



One of the 10-Horsepower Nash Engines Used.

higher than that for alcohol. The above thermal efficiencies are calculated from the brake horsepower and the low calorific value of the fuel, which, for the gasoline, was 19,100 B. t. u. per pound, and for the denatured alcohol, 10,500 B. t. u. per pound.

As has been previously published, alcohol can be used with more or less satisfaction in stationary and marine gasoline engines, and these gasoline engines will use from one and one-half to twice as much alcohol as gasoline, when operating under the same conditions. The possibilities, however, of altering the ordinary gasoline engine as required to obtain the best economies with alcohol are very limited. The amount that the compression can be raised without entirely redesigning the cylinder and valve arrangement, is ordinarily not sufficient, nor are the gasoline engines usually built heavy enough to stand the maximum explosive pressures, which often reach six and seven hundred pounds per square inch. With the increase in weight for the same size engine designed to use alcohol instead of gasoline, comes an increase in maximum horsepower of a little over 35 per cent., so that its weight per horsepower need not be greater than that of the gasoline engine, and probably will be less.

The work was taken up to investigate the characteristic action of fuels used in internal combustion engines with a detailed study of the action of each fuel as governed by the many variable conditions of engine manipulation, design and equipment. These variables were isolated, as far as possible; their separate and combined effects were determined, worked out under practical oprating conditions, and led up to the conditions required for minimum fuel consumption. The results show the saving that can be obtained over conditions for maximum consumption, and also establish a definite basis of comparison under conditions most favorable to each fuel. This latter is a point of much commercial interest, and a study of the comparative action of gasoline and alcohol may be of great service in solving some of the general internal combustion engine problems where other than liquid fuels are used.

A large number of fundamental tests were necessary in order to clearly define conditions and interpret results. In a way, they follow the work conducted by the Department of Agriculture, supplementing to a certain extent, but not duplicating, Bulletin 191, which gives much data of general value. Many of the tests of internal combustion engines have been made, but most of them, especially in this country, were by private concerns, for a specified purpose, and the results are not generally available. Furthermore, as is generally recognized by those familiar with gas, and especially gasoline engine operation, the conditions influencing engine performance are so numerous and various as to make the value of off-hand comparison very limited and often misleading, exact comparisons only being possible under identical conditions, or with reference to the actual known differences in all conditions that influence the results.

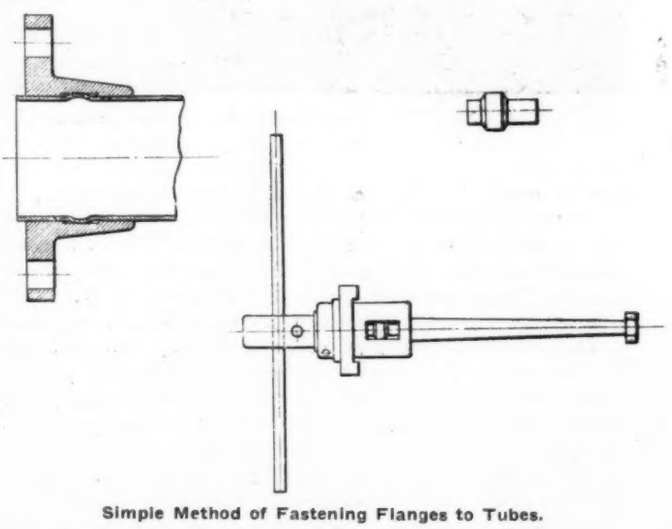
FASTENING FLANGES TO TUBES.

By E. T. BIRDSALL, M.E.

In the design of most automobiles and motor boat engines, steel and copper tubing having comparatively thin walls is used for inlet, exhaust and water conduits. This tubing is connected to the engine and its accessories by means of flanges, usually by soldering or brazing. The brazing of the flanges to the tubes is an expensive operation calling for a brazing plant, and the soldering always gives more or less trouble. In addition, there is the labor of cleaning off the scale and surplus brazing or soldering material from the parts, which are often seriously damaged by the heat required in the operation.

The process of rolling or expanding the tubes into the flanges, or other parts, in exactly the same manner as boiler tubes are secured into a boiler shell, has been used by the writer for some time with perfect success. The only tool necessary is a roller-expander having the rolls specially shaped for the work. In the illustration, the flange is shown with a recess turned in its interior and the roller is so shaped and adjusted that when the stop on the expander is against the end of the tube, the greatest diameter of the rolls will be opposite the recess of the flange.

The job shown is a 1 3-4-inch O. D. seamless steel exhaust pipe of No. 16 gauge, expanded into a steel casting flange. The pipe projects 1-8 inch beyond the face of the flange and into the exhaust manifold in order to prevent the gasket from blowing out.



Simple Method of Fastening Flanges to Tubes.

These joints can be made by one man and require about five minutes each. They are absolutely gas-tight and present a very neat and workmanlike appearance. A tube can be securely fastened in this manner to a part, that, owing to its low melting point, shape, location, or other cause, would not admit of the brazing process, and the job when made in this fashion is not only far neater in appearance, but is likewise much more durable and is not apt to give trouble at an unexpected time.

COMPARISON OF FOUR AND SIX-CYLINDER MOTORS

By ARTHUR H. DENISON.

NOW that the amusing comparisons by enthusiastic manufacturers of four and six-cylinder engines of the centipede, spider, horse, ostrich, and "even peaches growing on cedar trees" types is at an end, the purchasing public is interested mostly in the dollars question; also what actually takes place in the four-cylinder and the six-cylinder motors, that one is claimed to be so much superior to the other. Judging from questions asked on the subject, there may be a widespread impression that the addition of two cylinders is merely an excuse to hide defects in the design and construction of the four-cylinder motors. Here

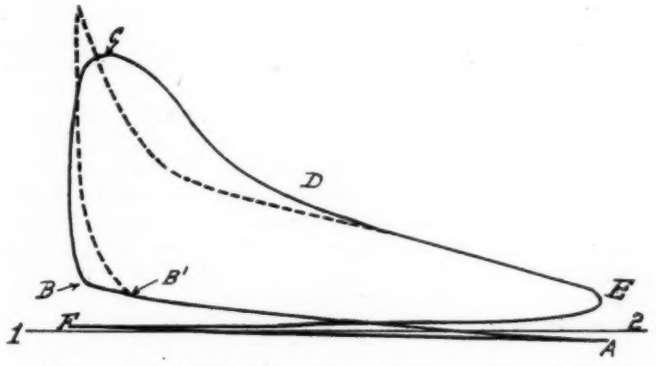


Fig. 1.—Typical indicator diagram showing average efficiency.

it may be said that a theoretically perfect motor, if such could be built, will give most unsatisfactory results, if subjected to inexperienced handling.

Consider first the four-cylinder, four-cycle motor. This represents the highest efficiency possible to obtain for general touring purposes, from the least number of cylinders and the minimum weight. Giving one power impulse for every half revolution of the flywheel the four-cylinder motor when turning at a speed of 300 revolutions per minute or more and propelling the car, causes so little vibration that one is conscious only of the smoothness and quietness of the machinery—assuming a well-built car, of course. If the car is standing and the motor running slowly, vibration cannot be escaped under any conditions or with any motor, and usually it is disagreeable to the occupants of the tonneau. In order to effectually compare the four and six-cylinder motors, we must thoroughly understand the relations of the essential parts of each motor, the flywheel, pistons, carbureter, etc., and their influence on the action of the motor.

Fig. 1 is taken from a photographed diagram of a four-cylinder motor, but the diagram, showing what took place in an individual cylinder, may be considered as a typical diagram of one-cylinder, irrespective of whether a one, two, four, six, or eight-cylinder motor is under discussion. *F* indicates the beginning of the suction stroke; *A* the lower dead center and commencement of the compression stroke, ignition taking place at *B*, the pressure rising to about 15 atmospheres at *C*, and the curve *D*, the drop in pressure to the exhaust valve opening at *E*. Therefore, the distance from *F* to *A* represents one-half revolution of the flywheel on the length of the motor's stroke. The line 1-2 indicates the line of atmospheric pressure. This diagram represents a fairly high standard of efficiency. Its faults are: Ignition was a little retarded, taking place almost on dead center. The exhaust stroke finishing slightly above the line of atmospheric pressure indicates trouble in getting rid of the exhaust, possibly in valve-timing or in the muffler, and this will materially affect the action of the carbureter and quality of the mixture in the following suction stroke. This is indicated by the end of the suction stroke lying below the line of atmospheric pressure; therefore, what we really have during the compression stroke is a mixture of burnt and new, or fresh, gas that will cause a fairly high compression, yet poor explosion, because we cannot burn gas twice, and a portion of the charge is burnt gas. This diagram, considered as taken from cylinders No. 2 or 3, may show a slightly higher efficiency than from cylinders No. 1 and 4, due to inlet and exhaust manifolds and water connections. If ignition had taken place nearer the theoretical point *B I*, the dotted line would represent the curve, showing slightly more power developed.

In a four-cylinder motor, while one piston is descending on its power stroke, another one is ascending on its compression stroke. Considering the diagram, the piston on power stroke is subject to effective pressure for about 1-4 to 1-3 of its stroke, the pressure gradually becoming weaker until, when the exhaust valve opens, it has fallen to about 1-4 of its initial pressure.

With the valve opening 30 degrees ahead on a motor with a 5-inch stroke, this represents 1-6 of the stroke or 5-6-inch. This amount of lead is absolutely necessary to allow the expanding efforts of the gas to be directed through the open valve, thus relieving the motor of much work in clearing them out, and also to reduce back pressure. There is, therefore, during each one-half revolution power being developed in one cylinder and three other pistons working yet using power. There is also a period of constant pressure against the piston lasting only a fraction of the stroke, and this energy must be stored in such a manner that the rest of the motor may draw on it without materially affecting the speed of the engine. Consequently, we have flywheels weighing up to 150 pounds and up to 28 or 30 inches in diameter. This flywheel may seem to keep the engine running smoothly, yet actually it is far from doing so.

The cylinder, whose piston is on its compression stroke, is constantly demanding more power to overcome the resistance of the gas at a time when the power stroke has practically ended and ignition taken place before dead center puts a heavy load on the flywheel to carry the piston over dead center against the pressure of the expanding gas, as the diagram, Fig. 1, shows, running as high as 15 atmospheres. Those who have felt a back-kick when cranking will realize the amount of power needed. The two other cylinders, one on the exhaust stroke and the other on the suction stroke, are also using power to overcome the resistance of valve springs as well as friction at every contact

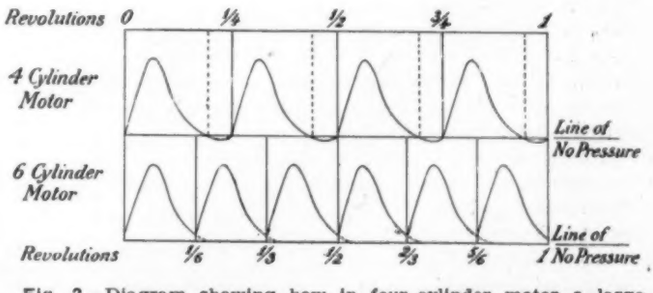

Revolutions 0 1/4 1/2 3/4 1
4 Cylinder Motor
Line of No Pressure
6 Cylinder Motor
Line of No Pressure
Revolutions 1/6 1/3 1/2 2/3 5/6 1

Fig. 2.—Diagram showing how in four-cylinder motor a large portion of each stroke is not developing power, the curve passing below the line of no pressure. In the six-cylinder motor the curve never reaches the line of no pressure.

point, and the flywheel must supply all of this. Thus, in one complete revolution, the flywheel must alternately receive and give energy. During this revolution, the flywheel receives energy through about 1-3 of the stroke; therefore, 2-3 of the stroke, or 2-3 of the revolution, the motor is dependent upon it, the proportions being the same.

Considering the six-cylinder motor from the same standpoint, Fig. 1 may be taken as a diagram from one of its cylinders, the dimensions being the same in both motors. The individual

operation is similar to that in the four-cylinder motor. There are also two more cylinders working; consequently, that much more power to be utilized. This is done by constructing the crankshaft in three series of two rows—see Fig. 3 and pistons Nos. 1 and 6, 2 and 5, and 3 and 4 on the same horizontal plane. Each cylinder fires separately, and, instead of the flywheel receiving an impulse every 180 degrees, or two per revolution, it receives one every 120 degrees, or three per revolution; thereby gaining 1-3 of the stroke, or one impulse per revolution over the four-cylinder motor. This is the great advantage, for, instead of the flywheel, we have a cylinder furnishing power to directly overcome the internal resistance of the motor, and the surplus, a considerable percentage, is devoted directly to the end in view, that of propelling the car or keeping the motor turning.

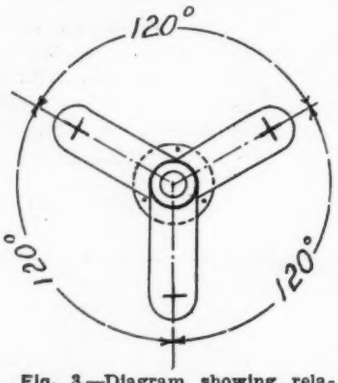


Fig. 3.—Diagram showing relative positions of the crank pins of a six-cylinder motor flywheel flange in rear. Shaft viewed from the front end.

Summing up theoretically, there is a decided advantage in favor of the six-cylinder motor, but there are many other things worthy of being taken into consideration. In the four, the flywheel, receiving and then giving energy, is subject to a certain amount of fluctuation in its speed. The impulses delivered by the motor may be likened to an alternating current wave, rising to maximum pressure, then dying away. This produces considerable vibration, which will be apparent by watching mudguards, searchlights, dash-lamps, and, in large motors, a very pronounced quivering of the whole car is seen. It also has a bad effect on the machinery, locking of nuts and bolts, and hastens fatigue. The six, on the other hand, with the steadier flow of power and the energy developed by each impulse being used directly, does not require as large a flywheel or shake things up nearly as much. The sound resembles a contented purr, the note from one exhaust blending into the next, instead of the sharp beat noticeable in the four.

The six-cylinder car cannot be called a fad. Many manufacturers are building both four and six-cylinder cars, and some exclusively sixes. One successful six-cylinder car, the Stevens-Duryea Big Six, with cylinders 4 3-4 by 5 1-4 inches, uses a flywheel catalogued at 90 pounds. On the 1906 Thomas four-cylinder 5 1-2 by 5 1-2-inch motor the flywheel weighed 105 pounds, and on the 1906 Peerless four-cylinder, 4 1-2 by 5-inch motor the flywheel weighed 96 pounds. Weight of flywheel has been a strong six-cylinder talking point, yet these figures denote much weight saved. Possibly the reason for using so large a flywheel is to take care of the motor in case of trouble: two cylinders giving trouble would have a more marked effect on the performance of the motor than one cylinder in the four, considering crankshaft in arrangement and resistance of dead cylinders. Another point is the extra weight of the engine. This is important, as a car able to stand pounding over indifferent roads must, even with fine materials, go over 3,500 pounds fully loaded and with passengers. This, with added weight of accessories, water, extra length in crankshaft, case, and manifolds, means a substantial amount. To keep the extra cylinders cool means larger water capacity and increased radiator surface. The increased length necessary in engine is obtained by sacrificing space in the body or tonneau, or a wheelbase so long as to make the car unwieldy. The extra power means a larger factor of safety generally, and with a motor bolted solidly to the frame, the twisting due to rough roads imposes a bending strain on the crankshaft, in addition to the load of the power impulses. This bending and twisting of the frame throws the bearings out of line also, and the crankshaft endeavoring to maintain its alignment increases enormously the strain on the bearings. This is sufficient to force the oil out, and then the shaft and bearing suffer.

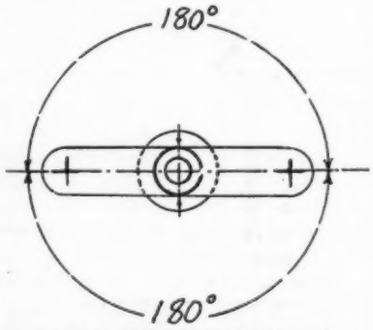


Fig. 4.—Diagram showing relative positions of the crank pins on a four-cylinder motor, with flywheel flange in rear. Shaft viewed from front end.

The peculiar phenomenon presented by a child's top or toy gyroscope is also present in the automobile flywheel. On a powerful motor, running light, its action may be noticed by the slight movement of the frame in the direction opposite to that in which the motor is turning. The force of gyroscopic action is said to increase with the weight of the spinning disc and its speed, but this force is not very well known, and it presents many peculiar and unexplainable properties. It is seriously considered as responsible for different troubles, such as broken steering gears, tire troubles, etc., that cannot be accounted for otherwise, and its influence on the long crankshaft of the six-cylinder motor might form an interesting chapter. Recent foreign reports seem to indicate that prominent French constructors will pin their faith on four-cylinders in the coming Grand Prix race. They are also willing to build anything the public will pay for. In conclusion "price" must be put down as the deciding feature. Both types are standardized, both giving excellent service. While the six-cylinder motor overcomes the disadvantages of the four in a marked manner, the purchaser must decide for himself whether on the whole the increased weight, cost, and advantages are worth the increased price.

GAS FLAME TO REPLACE SAW.

The employment of the oxyhydrogen blowpipe flame for industrial purposes is rapidly extending, says Robert Grimshaw in *The American Machinist.* Recently it has come into play for melting out "scaffolded" blast furnaces. It is further being used for melting off fins from castings, cutting off iron and steel, cutting out manholes—or cutting out the metal and leaving the holes, an it please you better—and naturally, for welding. This latter operation has long been done with a blast flame consisting of hydrogen and ordinary air, where of course the oxygen being less plentiful, the heating effect is not so great. Among the welding processes thus carried out is the manufacture of wrought-iron tubes from strips of wrought iron wound about a mandrel. The Ferrum Iron Works, in Upper Schlesien, has extended the oxyhydrogen welding process to the manufacture of tubes, which being intended to withstand a very severe internal air, water or steam pressure without leaking, are made of quite heavy strips of iron or steel sheet; the latter by reason of their comparatively great thickness would not lend themselves very well to the spiral rolling process, hence are made with a lengthwise weld. The principal advantage of the gas weld is, independently of the greater speed and convenience in making it, the fact that no slag is formed between the welded surfaces, hence the seam is more truly "metal to metal." The Deutsche Oxhydric Gesellschaft has for some time been making experiments as to the shape of burner, etc., best adapted to do neat and rapid work in cutting off, or in cutting out metal plates, etc. The most recent development in this line is the combination of a foreheating apparatus employing oxygen and hydrogen, with a cutting jet of pure oxygen playing on the surface previously made red hot by this oxyhydrogen jet. In the course of time, its use will doubtless be extended to a great many other processes.

ABOUT FORGINGS FOR AUTOMOBILE WORK*

By RICHARD W. FUNK, Member Society of Automobile Engineers.

AS the complete subject outlined in the title may not be embraced in a short article, I will confine myself to the presentation of some few facts showing the effect of certain forging methods on nickel chrome steel as against the processes known as hydraulic and drop-forging. The information includes some results of personal experience gained in the business of making alloy steel forgings.

A certain operation known as drawing down is performed on most forgings, and it consists of hammering the piece on the square until near finish size, when the operation of rounding up begins. I have noticed that all good smiths follow this method, but have never had one in my employ who knew exactly why this was done, except that it was the quickest way to do the work. It is not uncommon to see a smith, while drawing down, allow the steam-hammer to strike with such force as to all but crush the material, often rending the structure in the case of poorer materials. Others again are timid about drawing down close to finish size before rounding up and begin the latter operation too soon, keeping the piece rolling on the anvil in the endeavor to produce a round section.

It is generally understood that hammering with care and at the proper heat improves steel, and my experience with alloy steels—that have been tested before and after being worked under the hammer—has taught me that the process of drawing down square should endure until finish size is practically reached, and that not until them should the rounding process begin; and then not by rolling around on the anvil indiscriminately, but by taking the corners with comparatively light blows. When drawing down square the blows should as nearly as possible be so gauged as to penetrate to the center and a very little beyond. The unmistakable sign will be that, in the finished piece, the core at the end will protrude a very little; not too much, as that would indicate that excessively powerful blows have been used and a crushing effect produced. As for the smith who draws square and starts to round up long before finish size has been reached, he will inevitably ruin the material.

The result of his handiwork is commonly known as piping. That is, the blows have had the effect of forming an outer shell which is drawn over the core and often separated from it in spots. This procedure leaves a hollow in the end which, in itself, should proclaim the fact that the material was not properly worked. If, on the other hand, the blows are powerful enough to penetrate to the center while working round, instead of square, there are set up continued sidewise shearing effects, shifting or sliding half of the section over the other half; in other words, the operation amounts to nothing more or less than continued violent disruptions, leaving a jagged hole extending through the length of the piece. To give some idea of the importance of the proper gauging of the hammer blows as described, in conjunction with the proper heats, I will name some actual tests in this connection that stand out in my memory.

I had occasion quite some time ago to forge a 600-pound crankshaft billet for Mr. Herreshoff, of whose endeavors you all have heard.

The normal figures of the material used were:

Tensile strength	125,000 lbs. per sq. in.
Elastic limit	118,000 lbs. per sq. in.
Elongation	18 per cent. in 2 inches.
Reduction of area	48 per cent.

The billet was hammered by myself and, after being annealed, was ready for machining, having been given no other heat-treatment of any kind.

At the works of the American and British Mfg. Co. test pieces were cut which gave the following figures:

Tensile strength	204,000 lbs. per sq. in.
Elastic limit	174,200 lbs. per sq. in.
Elongation	14 per cent. in 2 inches.
Reduction of area	45 per cent.

Against this performance I can place the figures found by Mr. Fay, our president, on testing some crankshafts of the same material, which I had the opportunity of supplying about the same time. The shafts in question were forged by the hydraulic press method—which is eminently a crushing process—then heat-treated twice most carefully, according to the best known methods at the mill where the steel was originally made, and the figures resulting were:

Tensile strength	154,400 lbs. per sq. in.
Elastic limit	133,300 lbs. per sq. in.
Elongation	11 per cent. in 3 inches.
Reduction of area	25 per cent.

The hammer method of treating shows an average improvement of 48-1-2 per cent., while the other method in combination with heat-treatment shows the slight average loss of 4 per cent.

Of course, the shafts were not made of the same piece of steel, but I have in my two years' handling of the same material found it to be what may be called uniform. Besides, as stated, the heat-treating was done at the home mill in Germany, where I know them to be very careful and painstaking, and the billet first described was forged here under very adverse and crude conditions. Again, I would not think of putting this in writing if the two years following I had not observed the same condition numberless times.

This seems to show that heat-treatment is valuable as a means of shifting the figures of physical properties to suit desired ends, but does not so much mean an all round improvement, while the material may, without a shadow of a doubt, be improved all round by observing the proper care in heating and hammering. I have further found that a shifting of physical properties may be obtained besides, as readily and nearly as accurately as by different heat-treatments. As for instance: If highest tensile strength and elastic limit with correspondingly low percentage of elongation be desired, I would work the steel at a lower heat than I would if higher figures were desired for elongation or reduction of area. In conclusion I would like to observe that I have seen figures advertised that would not uphold my conclusions, but I have in mind actual tests made by customers who wished to satisfy themselves, and not catalogue figures.

*Paper read before the Society of Automobile Engineers at Boston, March 10-11, 1908.

AUTO AS AN AID TO SURGERY.

Upon being called to attend a patient far out in the rural districts, and finding him in immediate need of surgical attention with the nearest hospital 15 miles away and night falling, Dr. W. B. Reid, of Rome, N. Y., was not in a quandary but immediately set to work. The kitchen was converted into an operating room and the ironing board constituted the operating table, but the question of suitable light where nothing but unshaded kerosene lamps were to be had presented a problem until Dr. Reid thought of his auto, which was a Ford runabout. It was backed up until right under the kitchen window, one of the headlights removed and an extra length of rubber tubing attached to the tank, so that the lamp could be brought close to the improvised operating table. In the doctor's opinion, the automobile with its gas tank and lamp proved a strong factor in saving the patient's life, as he happened to have appendicitis, and the disease had already reached such an advanced stage when the doctor was called in that a delay of a few hours would certainly have proved fatal, and any attempt to move the patient, even with the aid of every facility, could only have had the same ending.

GEAR ARRANGEMENTS AND RATIOS IN AUTOMOBILES

THE fact that in the recent Scottish trials of motor cars no less than 27 per cent., or 22 out of the 81 cars which completed the trials, failed to take their load up all the hills, shows that the calculation of the gears for a car is not yet always understood, says *Engineering* (London). The fact that in the three and four-speed cars the ratio between the top and bottom speeds varied from 2 to 1 to 10 to 1 confirms this view. There were cases, no doubt, in which the failure in hill-climbing was due to defects in the engine, but in the majority of cases it was simply due to the bottom gear not being low enough, and the result could perfectly well have been foretold.

In the present state of knowledge as to motor cars there are ample data to calculate the performance of a car beforehand with as great accuracy as that of most other kinds of machinery, and, therefore, the whole subject of gears should be treated in a scientific manner. In order to calculate the performance of a car under certain specified conditions, we want to know the resistance and tractive effort. The resistance depends on—

1. That due to rolling resistance on the road.
2. That due to the gradient.
3. That due to wind.

At the speeds at which reasonable motorists go, the latter is comparatively small, and for hill-climbing purposes negligible.

The tractive effort depends on—

1. The torque the engine will give.
2. The friction of transmission.
3. The ratio of gear between the engine and back wheels.
4. The diameter of the back wheels.

Although we seldom know all these factors with absolute accuracy, we know them near enough for practical calculations.

Taking the question of the greatest resistance to be overcome first, we may take it for granted that a modern motor ought to be able to take its full load up any hill on a road habitually used for horse traffic. This means that it must take it up short stretches of 1 in 4. The resistance expressed in pounds per ton (2,240 lbs.) due to this gradient is 560 pounds. Rolling resistance will vary a good deal with the surface of the road; but as the surface on steep hills is generally bad, it may reach 100 pounds per ton, making a total tractive force required of 660 pounds per ton.

Assuming that we know the brake horsepower of the engine at the revolutions at which it gives its greatest torque, we can calculate the tractive effort as follows:

The torque in inch pounds =

$$\frac{\text{Brake horsepower} \times 63{,}024}{\text{Revolutions per minute}}$$

The tractive force in pounds per ton is then=

$$\frac{\text{Torque} \times \text{ratio of gear} \times \text{efficiency of transmission}}{\text{Weight in tons} \times \text{radius of driving wheels in inches}}$$

If there should not be an actual brake test of the engine available, as in the case of a design which has not yet been built, it is usual to estimate the power the engine will give by assuming a torque equivalent to a mean pressure in the cylinder which is estimated by experience. In this case it is simpler to use the assumed mean pressure directly to calculate the tractive force, as follows:

Tractive force per ton =

$$\frac{\text{Cylinder area} \times \text{stroke} \times \text{mean pressure} \times \text{ratio of gear} \times \text{efficiency}}{\text{Circumference of driving wheel} \times 2 \times \text{weight in tons}}$$

all dimensions being in inches. If more than one cylinder, the total area to be taken.

In these formulas the only uncertain factor, if we have a brake test of the engine, is the coefficient of friction of the transmission gear. Absolutely definite experiments on hardened-steel gear wheels running under the varying conditions of motor work are wanting; but an assumption of a loss of 8 per cent. for each pair of gear wheels through which the power passes corresponds very closely with the actual performance of cars on the road.

If we assume that there is a loss of 8 per cent. of the power transmitted for each pair of gear wheels it goes through, the following will be the efficiencies of the various arrangements. In these some small losses, such as that of the back shaft, when running idle, and that of the universal joint, are omitted. These may vary slightly in different cars, especially that of the universay joint. In a well-designed car, however, this should run practically straight, and all the small losses together should be a negligible amount. The shaft-to-shaft gear box will have an efficiency of 92 per cent on all the speeds, and as the efficiency of the bevel drive is 92 per cent., the efficiency of the whole transmission from the engine to backaxle will be 92 per cent. of 92 per cent. = 85 per cent.

The direct-drive gear box, when the direct speed is in use will have an efficiency of 100 per cent., and therefore the efficiency of the whole transmission will be 92 per cent. of 100 per cent. = 92 per cent.

The direct drive-gear box, with any of the indirect speeds in use will have an efficiency of 92 per cent. of 92 per cent. = 85 per cent., and the efficiency of the whole transmission will be 92 per cent. of 85 per cent. = 78 per cent. In the case of a car with side chains there will be the friction of these in addition, which will lower the above efficiencies to about 5 per cent. all around.

In estimating the torque we are likely to get from an engine, we should assume that it is not likely to materially exceed that corresponding to 95 pounds mean pressure, even if the compression, etc., are arranged for getting the greatest possible power; though a few engines, when carefully tuned up, may reach 100 pounds. If, on the other hand, power is sacrificed to other considerations, such as extreme silence, it may be a good deal less.

It is, perhaps, easiest to show the working of a formula by taking a definite instance. Let us assume a car with four cylinders, 3 1-2 × 5 inches, weighing, with passengers, 3,360 pounds, having 32-inch driving wheels, a live axle, and a direct drive on the top speed. Assuming a torque equivalent to 95 pounds mean pressure and 78 per cent. efficiency on low speed, we get a tractive force for gear ratio 1 to 1 of

$$\frac{38.48 \times 5 \times 95 \times 0.78}{100.5 \times 2 \times 1.5} = 47.3 \text{ pounds per ton.}$$

Consequently for a tractive force of 660 pounds we must have gear ratio of

$$\frac{660}{47.3} = 14.0 \text{ to } 1,$$

equivalent to a speed of 8.2 miles an hour at 1,200 revolutions per minute of the engine.

A moderate powered car should probably be able to take its full load up about 1 in 16 on a road with a pretty good surface, which means a tractive force of about 200 pounds per ton, *i. e.*, a ratio of 3.3 between the tractive force on the top and bottom speed. The ratio of gear between the top and bottom speeds will have to be greater than this, owing to the lower efficiency of the low speeds, which is only about 85 per cent. of the top. It will therefore be about 3.9 to 1. In a low-powered car the ratio should be greater than this, as we shall not be so ambitious as to go up hills at our top speed. In a very high-powered car, however, it can be a good deal less. Probably while the low and moderate-powered car wants a ratio of about 4 to 1, the high-powered car should be about 3.5. Experience in these trials showed conclusively that it was merely a matter of either straining a point to gear a car too high for the load it was designed to carry on stiff grades, or of simply guessing at what its gear ratio should be.

LETTERS INTERESTING AND INSTRUCTIVE

FOUR-CYLINDER SEQUENCE OF IGNITION.

Editor THE AUTOMOBILE:

[1,278.]—The writer is an owner and amateur driver who reads "The Automobile" with interest each week, and herewith takes the liberty of requesting your decision on the following point in settlement of an argument. I maintain that a four-cylinder motor, four-cycle, with piston numbers 1-4 and 2-3 parallel on a 180 degree crankshaft, must fire either 1-2-4-3 or 1-3-4-2. An automobile factory man tells me that it fires 1-4-3-2, and scouts at my assertion that this firing order is impossible.

My contention is that with piston number one at the beginning of the firing stroke, number four on the same downward stroke, and traveling parallel with number one, will be commencing its intake, and that it can fire only after another cylinder has intervened between it and number one.

My point is that, regardless of arrangement of cams for intake or exhaust, a motor cannot fire 1-4-3-2, and that with such a firing order an entire half stroke with no power application would result in number four, as the piston must, of course, be at the top of the cylinder at the time of firing. Moreover, I contend that such a sequence of firing would result in the same conditions between numbers three and two. HARRY S. HALL.

New York City.

Your contention is quite correct. It would not be possible for the average four-cylinder automobile engine, which is constructed with the crank-throws in pairs, each pair being 180 degrees apart, to fire in the sequence 1-4-2-3, as cranks Nos. 1 and 4 and 2 and 3 are in the same plane. Counting from the forward cylinder rearward, it would ordinarily be 1-3-2-4, though this is naturally not arbitrary, as any arrangement in which a cylinder having its crank in one plane is followed by a cylinder with its crank in the opposite plane is permissible, and it will be found that many makers set their motors to fire differently in this respect. If the timer were set to spark the cylinders in the sequence 1-4-2-3, only two cylinders would be operative, the sparks for the other two occurring at a time when there was no charge under compression. A canvass of the six-cylinder motors staged at the two New York shows last Fall revealed the fact that practically every one of the permissible sequences of firing was employed on one or another.

SELF-STARTING WITH MAKE-AND-BREAK.

Editor THE AUTOMOBILE:

[1,279.]—Can you give me directions for remodeling a make-and-break ignition system so as to make a car self-starting from the seat, if this is practicable with this type of engine? The ignition system, as it is, gives excellent service, the current being supplied by a magneto, but there are times when I am almost disposed to exchange it for a high-tension system, as a means of avoiding a large part of the labor of cranking. A. W. INGLIS.

Lafayette, Ind.

To make the change is not so simple a matter as might appear, but it can be done without resort to a high-tension system. The first essential, of course, is a battery to supply the current at starting, the magneto being capable of generating current only after the motor is under way. Then, by the provision of switches for connecting the battery and disconnecting the magneto, and some manual device for contacting and separating the make-and-break elements in all the cylinders, it becomes possible to produce the necessary spark for self-starting. As soon as the motor has taken up its cycle and is running regularly, the battery can be switched off and the magneto switched on. Naturally, with the great diversity of make-and-break systems that are in use, the application of these modifications to any given car must be worked out to suit individual conditions and requirements. With at least one system of magneto ignition now applied to a modern car, provision is made for self-starting by hand rotation of the magneto armature, which is for the moment disconnected from the regular drive.

DIRECT-CURRENT DYNAMO FOR IGNITION.

Editor THE AUTOMOBILE:

[1,280.]—I have a dynamo, manufactured by the Hillsdale Igniter Company. This dynamo has been used for current supply for a sixteen-horsepower stationary gasoline engine. Please state if the following plan will work successfully?

Place this dynamo so as to drive from the flywheel of a 22-horsepower Buick car. Run two wires to a storage battery, from storage battery to coil and commutator in the ordinary manner. Run two other wires from the dynamo to large lamps with electric globe attachment. What I want to know is, will this work satisfactorily for igniting and lighting purposes? If you think not, will you kindly suggest some plan to do away with storage battery, if possible?

Sumter, S. C. E. W. MOISE, JR.

The dynamo may be used successfully if it is equipped with a reliable governor to prevent it attaining an excessive speed, which would cause the armature to burn out, and there is a cut-out device placed in the circuit between the generator and the storage battery to prevent the latter from overcoming the voltage of the dynamo and discharging through it when the speed drops. The lamps could not be wired directly from the generator, as the voltage fluctuates so much, due to the extremely irregular speed of an automobile motor that at one moment they would be dim and the next the filaments would burn out, due to the excessive rise, unless the governor held the dynamo speed within permissible limits. The use of a small direct-current generator is not feasible on a car without a storage battery, and there must be a reliable governor to protect the generator and a cut-out to protect the battery. There are outfits of this kind on the market that have been in successful use for a number of years. The reason why such a dynamo can be used with a stationary engine without these protective devices is because of the speed remaining constant.

COMPUTING AN AUTO'S TRACTIVE POWER.

Editor THE AUTOMOBILE:

[1,281.]—Will you please favor me with the formula for computing the tractive power of an automobile? W. W. WALLER.

Washington, D. C.

The tractive force of a motor-driven vehicle may be computed with the aid of the following formula:

$$T = [a + rf + b(v - 3.28)]\ W \div R$$

in which

T = traction in pounds, this value being the sum of the two calculations for the forward and rear pair of wheels.

W = gross weight in pounds upon the wheels, including the weight of the wheels themselves.

R = radius of the wheels in inches.

r_1 = radius of sprocket, or chain-driving wheel.

f = coefficient of friction for wheel bearing, which will vary according to type.

a = value of rolling constant for wheels with pneumatic tires, this being 0.14 for the latter.

b = value of speed constant for wheels of springed vehicles on an ordinary macadam road in fair condition, this being given as 0.25.

v = velocity of vehicle in feet per second.

Of course, there are other factors to be considered, such as the resistance of the air and the extra pull required by a grade.

The gradient may be taken as 1 in a distance equal to N, and, taking T_1 as the additional traction due to the incline, we have:

$$T_1 = (W + T) \div N$$

In pounds per square foot of the surface presented, the air resistance generated by the car itself alone being considered, as the wind is entirely too variable a factor, this equals the velocity of the car in (miles per hour)^2, times 0.00492, or, in (feet per second)^2, times 0.002288. Taking this resistance as P, and writ-

ing T_3 = additional traction due to this resistance, then

$$T_3 = P(R + rf) \div R$$

But the pull of the chain in a car of that type, or the thrust of the gearing, in a shaft-driven car, produces extra pressure on the bearing, equal in a chain-driven car approximately to

$$(T + T_1 + T_3)\ (R - r) \div R$$

Denoting this additional traction by T_3, whence

$$T_3 = rf\ (T + T_1 + T_3)\ (R - r) \div Rr_1$$

This, then, includes all the factors of resistance to be taken into consideration, and their total may be represented by T_0, then

$$T_0 = T_1 + T_2 + T_3$$

Example: Find the tractive pull of a car of one ton gross weight, on springs, to travel at 14 miles per hour up a gradient of 1 in 30, weight assumed equally distributed on four pneumatic-tired wheels, driving wheels 36 inches, front wheels 28 inches. Driving sprocket 12 inches, axle 1 1-2 inches diameter, area of car exposed 30 square feet.

The tractive pull of the front axle will be

$$T_0 = T + T_1$$
$$= 51.6 + 39$$

While that of the driving axle will be

$$T_0 = T + T_1 + T_2 + T_3$$
$$= 40.1 + 38.6 + 29 + 1.6$$

which gives the total traction as equivalent to 200 pounds, equal to 7.4 brake horsepower. The foregoing data is from the *Practical Engineer*, London.

ABOUT THE RELIABILITY OF AIR-COOLING.

Editor THE AUTOMOBILE:

[1,282.]—Having read your paper for almost a year now, I am very much interested in the "Letters" on the different subjects that are brought up in each issue. I have a subject which I, with lots of other subscribers, am interested in.

Are there any air-cooled, two-cylinder, four-cycle automobile engines on the market which are as reliable and successful as the same in a water-cooled engine? In brief, is an air-cooled engine as economical or reliable and successful as a water-cooled? In your estimation would an engine air-cooled, with cylinder 5 inches in diameter by 5 1-2 inch stroke, be as efficient as one 3 1-2 inches in diameter by 4-inch stroke? Which size would be the most successful, or would there be any difference in the cooling effect?

Is friction drive on an automobile efficient and successful?

Would solid tires be successful on an automobile equipped with full elliptic springs, or would they be injurious to the car in general? Which kind would give the most and best service, a cushion or solid gum? WM. McLOY.

Elizabeth, Pa.

There are quite a number of two-cylinder, air-cooled, four-cycle engines on the market, practically all of the horizontal opposed type. Some of them have been used on hundreds of cars that have seen service for several years, from which we should judge they were successful, otherwise they would have been abandoned long since. An air-cooled engine is more economical of fuel than a water-cooled type owing to its greater thermal efficiency, and for this reason it requires more lubricating oil, as it runs much hotter. The difference in lubricating oil consumption is nothing like sufficient to offset the economy in fuel.

If both engines were of exactly the same design and were worked under equally favorable conditions, there should be no appreciable difference in their efficiency. Judging from the fact that, except for racing purposes, air-cooled automobile motors are seldom built to exceed 4 to 4½ inches bore, probably the smaller engine might give better service in unskilled hands and under adverse conditions, but the successful performance of larger air-cooled motors would appear to indicate that there is no reason why the dimensions in question cannot be exceeded. It is more a matter of compression than of size, as the latter would only imply an increase of volume, and the former an increase in the temperature, other things remaining the same.

Judging from the number of cars equipped with a friction drive that are turned out annually, both in this country and Europe, this type of transmission would appear to be entirely practical for every-day use.

It depends entirely upon the car and the service that is required of it. If excessive speed be not desired and the roads ordinarily traversed are fairly smooth, solid or cushion tires should give satisfaction. The solid rubber tire would probably give the better service. We do not believe there are any cushion tires for automobile use on the market to-day, though some of the solid tires made have a small hole running through the center.

MORE ABOUT BRAKING WITH THE HIGH.

Editor THE AUTOMOBILE:

[1,283.]—Being a constant reader of "The Automobile," I naturally take quite an interest in the "Letters Interesting and Instructive." I notice on page 358, of the March 12 issue, a letter headed the "Practical Side of the Question." In this, the man from Minnesota mentions the use of the motor as a brake, or retarder. He states that the faster the drive wheels turn the motor, the greater will be the resistance, or braking effort, which is very true. Then he says to use the high gear on a very steep grade, and the intermediate on a lesser one, which is entirely erroneous, as on the high gear the motor runs slower than on any of the others, and hence gives the least braking effort.

On the high gear, the motor turns from 2 1-2 to 4 1-2 times, according to the design of the car, while the rear wheels are turning once, while on the low gear the motor turns 9 to 11 times, and more, also varying with the design. Which will produce the greatest braking effort? C. E. CARR.

Frederika.

Naturally, the low gear will always give the greatest amount of resistance in the motor when the latter is being driven by the road wheels, as in coasting down a hill with the ignition, or fuel, entirely cut off. Evidently, Dr. Hard got the thing confused in his own mind, and several other subscribers have already called attention to the matter. On anything but very stiff grades, however, it is customary with the general run of drivers not to drop from the high gear when coasting, the foot-brake being relied upon to supply whatever retarding effect is required in excess of that provided by the motor.

FOUR-CYCLING OF TWO-CYCLE MOTORS.

Editor THE AUTOMOBILE:

[1,284.]—I have a three-cylinder two-cycle boat engine which has developed a peculiar tendency to "four-cycle"—that is, for the explosions in each cylinder to occur on every other instead of on every down stroke. I had never hard of this phenomenon until I experienced it with my motor, but several friends tell me that it is a well-known effect, which never has been explained satisfactorily. This seems unreasonable, because if a thing cannot be explained or is not understood, it would appear impossible to rectify the fault it may occasion, yet I am not altogether prepared to believe that the engine in question must continue in its erratic working, for until recently it operated perfectly. The four-cycling occurs chiefly at high speeds and seems especially prone to occur at high speeds under light loads, as when the engine races through the propeller being lifted out of the water in a rough sea. The motor is an ordinary three-port type, the product of an amateur builder, but it possesses no "freak" elements in its design and has given a great deal of good service. Any information you can give on the subject, and especially anything that will directly help the situation with which I am confronted, will be appreciated.

Sandusky, O. C. E. WATKINS.

It is a fact that at one period in the development of two-cycle motors there was a good deal said about their mysterious "four-cycling" under some conditions, and, for anything that we would be able to prove to the contrary, it is entirely possible that some of the factors in this phenomenon may be unascertained. Nevertheless, we know positively that in a majority of such cases of "four-cycling" it is due to a comparatively simple set of causes, the existence of which must readily appear from a consideration of the functioning of a two-cycle motor. In these, to begin with, unless they are of unusual type, the displacement of the exhaust gases subsequent to each power stroke is effected almost wholly by the incoming charge, so that no more exhaust goes out than charge comes in. The result of this is that under

extreme throttled conditions, usually coincident with light load, there is an enormous retention of exhaust gases, with which only a small percentage of fresh charge is intermixed. Consequently, if this condition is made still more unfavorable to correct operation by some derangement of the mixture, ignition, which perhaps occurs none too readily anyway under the circumstances, may fail altogether. However, as the motor continues to turn over, a portion of a charge thus left unexploded is in due time exhausted as though it had exploded, with the simultaneous access of another increment of fresh mixture. This may improve the cylinder contents to the point of ignitability, and, as long as the condition persists, the motor will thus fire on alternate strokes—"four-cycling." From all of which you will see that carbureter trouble is implied—probably some maladjustment calculated to set up the peculiar balance necessary to produce the effect you note. We shall be interested to know how you make out, and to hear from others who may have had experiences along this line.

GEAR RATIOS OF A 45-HORSEPOWER CAR.

Editor THE AUTOMOBILE:

[1,285.]—Referring to letter No. 1,251, of "Letters Interesting and Instructive," in your current number, is your reply correct? My impression is that the gear ratio in the bevel geared drive is either 3 to 1 or 2 1-2 to 1, this being optional, and the former being the one that is put in unless the other is specially specified.

The additional reduction in the gearcase of the Pierce-Arrow a few years ago was 1 to 2 for the intermediate, 1 to 3:54 for the low, and 1 to 4:56 for the reverse.

Taking the ratio of 3 to 1 in the rear axle, we would have the following ratios between the engine and the hind wheels:

On high gear	3 to 1
On intermediate gear	6 to 1
On low gear	10:62 to 1
On reverse	13:68 to 1

and without being positive, my impression is that their present car is not very different from this. In lower powered cars three to one is quite usual in the rear axle, and doubling this for intermediate, and again doubling for low is, I think, quite customary. An improvement on this is to raise the speed on the intermediate so as to get about 3 to 1 on high, 5 to 1 on intermediate, and 12 to 1 on low. The design of the sliding gear transmission is such that of necessity the reverse must be somewhat lower in speed than the low speed ahead. "GASOLINE SAL."

New York.

Probably the makers misunderstood our question when supplying the information, as what you state concerning the gear ratio is correct for the average car. We will let the makers answer.

HOW MANY DROPS OF OIL PER MINUTE?

Editor THE AUTOMOBILE:

[1,286.]—Please let me know, through "Letters Interesting and Instructive," how many drops of oil per minute each cylinder of my double opposed 4 9-16 by 5-inch horizontal engine should have.

Portsmouth, O. SUBSCRIBER.

This is a matter that can only be determined exactly by experimenting a little, as different motors of the same make will frequently differ in this respect. Try 18 to 20 drops per minute for each, in order to be certain of having sufficient. If there is much smoke in evidence, cut the quantity down until it ceases to appear. Note the quantity of oil in the crankcase before beginning the experiment, and if no sign of smoke appears with the rate given above, run the motor under average normal load for 15 minutes steadily. Then examine the quantity of oil left in the crankcase, and, if unduly diminished, or increased, regulate the supply accordingly. A well-designed motor of this size, in good condition, should run smoothly on 10-12 drops per cylinder per minute, but it is better to go over, rather than under, the quantity, and it is quite a general practise with drivers to feed all the oil possible short of causing smoke. This is not a particularly economical procedure, but as the quantity of lubricating oil required to keep the average modern car in good running order is small under ordinarily favorable conditions, it is generally considered far better to use an excess.

A FURTHER DISCUSSION OF MOTOR EFFICIENCY.

Editor THE AUTOMOBILE:

[1,287.]—In your reply to Mr. Frost (1,206) and also to Mr. Pierson's statements (1,235) you claim that the power and efficiency of a gas engine are increased by lengthening the stroke. In regard to the power, I agree with you that there is an increase by lengthening the stroke, but there is not the same gain as obtained by increasing the bore for the same piston displacement increase.

Now as to the efficiency. Efficiency, in the first place, is the ratio of the heat converted into mechanical work to the total amount which enters the engine. Of course, the efficiency depends on the expansion of the charge, as stated by Mr. Pierson, but also on the heat loss to cylinder wall. Therefore, the most efficient motor is the one which not only gives the largest expansion or piston displacement for a given volume of charge, but also the one that does this with the least cylinder wall area. These two requirements cannot be fulfiled by a long stroke motor (i.e., a larger stroke than bore), but can be had with a short stroke motor (larger bore than stroke) of the proper proportions.

You also state that short-stroke automobile motors exhaust at terminal pressure as high as forty or fifty pounds, while stationary motors of good design get as low as ten or fifteen pounds terminal pressure. The utilization of the difference in pressure mentioned makes for greater efficiency, and is brought about directly by the stroke. Now this conveys the impression that the motor efficiency is greater with long-stroke, low terminal exhaust motors. Whereas, if the same expansion or piston displacement (with the same charge) were used on a larger bore than stroke motor, the efficiency would still be greater, even though the terminal pressure were higher (due to less cylinder wall heat loss), as reduction of terminal pressure by larger cylinder wall area will not increase efficiency, but lower it. The average stationary motor is also cooler.

We have all noticed the increase in motors using valves direct in the head, also the gain in power, flexibility and efficiency at slow and medium speed over the old style T-shaped chamber.

The gain in this type of motor is on account of a spherical combustion chamber, with reduced cylinder wall heat loss and charge reduction through heating on the suction stroke, as they have less cylinder wall area for a given volume. Now, if there is quite a noticeable gain in reduction of compression chamber area (for a given volume), should there not be a gain in reducing cylinder wall area for a given piston displacement as in using a larger bore than stroke motor in the proper proportions? The conclusions at which I have arrived are that the most efficient motor is the one with valves in the head, larger bore than stroke, high compression with fuel injection and expansion to nearly atmospheric.

With fuel injection, the compression can be increased to as high as five hundred pounds, as in the Diesel engine, without preignition, as fuel is not injected until the end of the compression stroke or center. Again, if this feature should be applied to an automobile motor, it would be very beneficial when running on a throttle charge with the possibility of increased power for hill climbing, when desired, at slightly reduced efficiency. Of course, it is not necessary to increase the compression to five hundred pounds to gain in efficiency; one hundred and fifty pounds, or even one hundred and twenty-five would be a practical increase.

Philadelphia, Pa. W. E. HAUPT.

SUCCESSFUL EXPERIMENTS WITH DEAD CELLS.

Editor THE AUTOMOBILE:

[1,288.]—Referring to Letter 1,233, in regard to rejuvenating dry cells and your answer thereto, we are not seeking to advertise our method of doing this, but, as a matter of "common knowledge" that certain alkaline solutions do as you say, there are others more adapted for still better results. As to cells being absolutely dead, twelve of them would not move a volt-ammeter, and for the same reason three of them are known to have been cast aside five years ago. It will be remembered, though, that whatever the age, the zinc must be in good condition. And when thus thoroughly treated, which requires but a few minutes, and at a cost of a few cents, it is certainly without a doubt profitable, for the additional period of activity will exceed more than half the original life. SELFE & WHITEFORD.

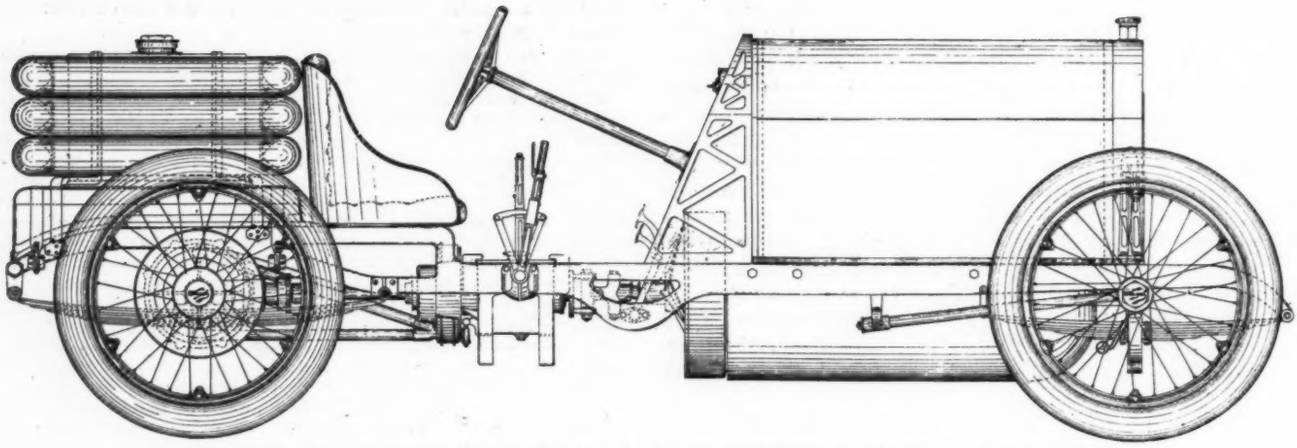
Darlington, Md.

HOW TO RENEW TOP LININGS.

Editor THE AUTOMOBILE:

[1,289.]—I notice you want an answer to inquiry No. 1,208. I had a customer bring me a repair job of that kind, and it puzzled me some before I thought of a scheme to remedy it. I bought a can of dull black "Jap-A-Lac," thinned this out with turpentine, and gave the cloth lining one coat of the same, covering the surface all over, let that dry and gave a second. This made it look almost as good as new. I hope this will help Mr. Fay out.

Corsicana, Texas. CLARENCE THOMAS (Auto Doctor).



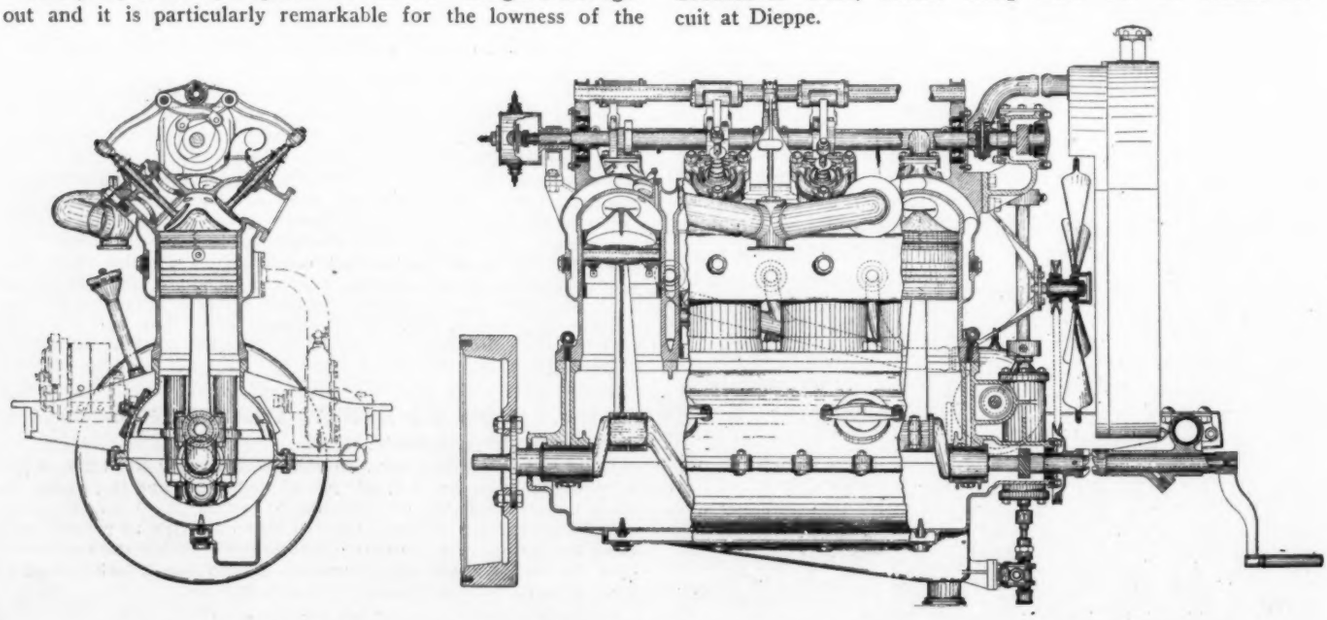
Side Elevation of 1908 Weigel Racing Car, Which Will Compete in the French Grand Prix.

ABOUT BRITISH CONTESTANTS FOR THE GRAND PRIX RACE

LONDON, March 20.—The number of British firms who are to try their fortune at Dieppe in July is now finally reduced to two. There is no prospect of the Napiers competing on account of the detachable wheel dispute, while nothing has been heard of the Ariel cars, of which the first was shown at last Olympia. With regard to the actual entries, the Austin cars are still under construction, but will probably be on the road by the beginning of April. The engines have six-cylinders 127 mm. by 140 mm., and the gearbox is provided with four speeds, the third being direct drive, with the fourth geared exceptionally high to enable fast work to be done on favorable grades. Two of the cars have chain transmission, the third and also the spare car having live axles. Although this is the first appearance of the Austin in road racing events, its designers have had long experience and before the formation of the present concern, made the Wolseley racers of 1905 and 1906.

The Weigel cars made their first appearance in last year's Grand Prix, and though they did not meet with much success, owing mainly to the type of detachable rims employed, they attracted much attention on account of the fact that nothing but parts of the standard 40-horsepower touring car were used. The engines were two four-cylinder units coupled together.

This year, however, a special car has been designed throughout and it is particularly remarkable for the lowness of the center of gravity. The engine has four cylinders 155 mm. bore and 175 mm. stroke, the four cylinders being cast in one piece. The valves are of unusually large size and are set to open directly into the combustion chamber at an angle of 45 degrees to the vertical. They are operated by a camshaft running above the cylinders. The pistons are of cast steel of very light section and the connecting rod bearings are of phosphor bronze with white metal linings. As regards lubrication the oil is forced by a pump through jets directly below each crank and the spray effectually lubricates the parts without excess of oil being able to reach the combustion chamber. The oil drains back to a pump at the front of the crankcase from which the pump is supplied. Two ignitions are employed, high tension magneto for normal running and battery and coil as a standby. A cone clutch replaces the flat plate type employed last year, and a three-speed gearbox conveys the power to the rear live axle. The frame, of channel steel, is kept low down, except at the rear, where it sweeps up to give the clearance for the back axle and to provide a seat for the driver, who is in this way only 28 inches from the ground. Detachable rims are used and the spares can be conveniently arranged round the fuel tank. These cars are practically completed, and will be put through extensive trials at Brooklands track, before being tried out on official circuit at Dieppe.



Sectional End and Side Views of Four-cylinder Motor Which Will Be the Power Equipment of the Weigel Racer.

Where the Holsman High-Wheeler Is Made

Model 5, the Latest Holsman Type of High-wheeled Auto.

THE owner of a Holsman car recently paid a visit to the factory of the Holsman Automobile Company at Chicago, for the purpose of investigating the new No. 5 model which the company is just putting on the market and has penned the following description of what he saw in that well-conducted plant:

"I expected to see a nice little runabout that would be serviceable and reasonable in price, and to say that I was agreeably surprised is putting it very mildly. I think this latest creation of their skilled mechanics will not be equaled for a long time to come. The lines on which it is built are artistic in every sense of the word, and the finish of every part speaks of good workmanship and good material.

"After arriving at Chicago, I first visited the Holsman general offices. These occupy the entire south end of the fourth floor of the Monadnock building. This building is said to be the largest office building in the world. Enough people go and come from this building every day to populate a city. I found this department of the Holsman Automobile Company a veritable bee-hive of business, and the whole place seemed alive with activity. After being most cordially received and shown the greatest consideration, I was given a letter admitting me to their factory. This document, I found, not only admitted me to their factory, but brought me the kindest attention from everyone in this great and busy place, which I understand is the largest producer in the world of the carriage or buggy type of automobiles, that truly American product.

"After viewing the No. 5 machine referred to above, I was shown first the wonderful motor which, connected with the countershaft and stripped of all other parts, constitutes the entire power plant for the different models of their machines. I was also very generously provided with photographs of the interior of the factory, along with one of the motor and countershaft. I consider this the simplest, lightest and most skillful power transmission for automobiles that was ever designed. The superintendent assured me that this was the secret of making a light machine. He also assured me that a light machine is a durable one. I believe this to be a fact, because it is in line with reason and common sense that extra weight in an automobile makes traction greater, uses more fuel and soon racks it to pieces.

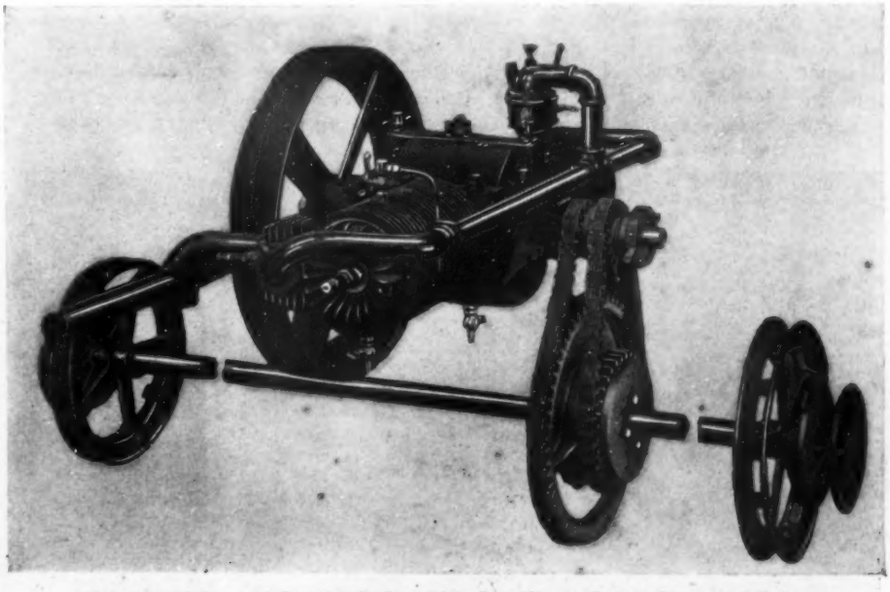
"I then visited the machine shop on the first floor. Every inch of space in this wonderful machine shop is utilized with metal-working machinery. I believe this is the busiest place and can furnish a larger variety of noises than any other place I ever visited in my life. Here emery wheels by the dozens are spitting fire, blacksmiths are forging red-hot irons, automatic saws are slowly cutting through large shafts of steel, also a hundred lathes are turning, groaning and screeching with turning off long, beautiful curls of metal from the parts which are being shaped. Hundreds of busy men are grinding, polishing, boring and fitting as if their lives depended upon it. This wonderful place with its hundreds of peculiar noises and clatter goes steadily on, night and day, for the plant is running to the extreme limit of its capacity.

"The motor assembling department on the next floor is where the most skilled mechanics in this branch of the work assemble and fit to the one-thousandth of an inch the various articles of bronze, steel and iron which go to make up the motor.

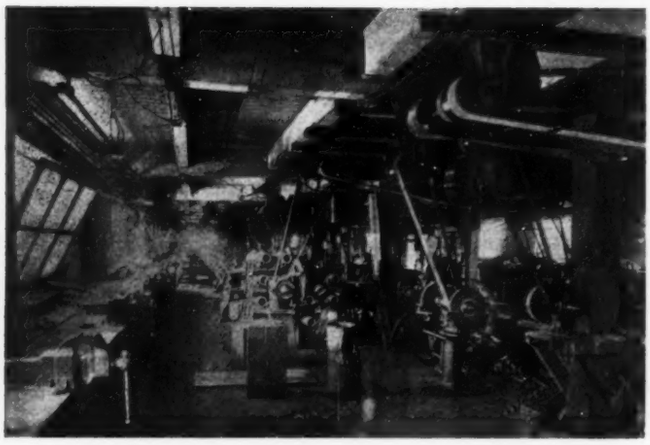
"The vehicle assembling room, illustrated in one of the photographs, is a busy place indeed. Here scores of men take the parts made in the machine shop and fit them together into the completed vehicle. Every man seems to know just what to do and how to do it with the least possible expenditure of energy.

"After being shown through this department, I was next taken to the testing room. This is a separate building. In this place a large number of motors are running at the same time at the rate of 1,200 to 1,500 revolutions per minute. Each motor is driving a large fan, which represents a certain amount of horsepower. This place is so filled with the hum of motors, the whir of fans and the whirling of air that one is reminded of a Kansas cyclone.

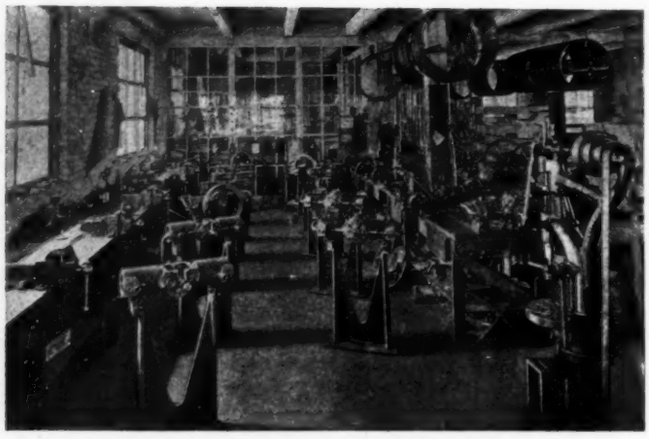
"The trimming room is on the top floor. Here the humming noise of the sewing machines is about all there is to be heard. In this department leather is cut, formed and stitched, the but-



Holsman Motor and Countershaft, which Constitutes Power Plant and Drive.



An Aisle in the Machine Shop of the Holsman Factory.



Corner in the Well-lighted Motor Assembly Room.

tons put into place, the finish put to artistic designs of backs and seats with the most wonderful skill. Here common every-day articles such as leather, wool, hair and cloth are fashioned into tops of perfect artistic beauty.

"The paint shop is also on this floor. A hundred or more vehicles are lined up and being painted. A blind man could easily tell when he was in this paint shop by the striking odor of turpentine and paints. These subtle artists are all plying their trade quietly but with great diligence. A person who has never seen it can never imagine the great change which takes place in the general appearance of an automobile after these tradesmen have given it their magic touch.

"We next visited the crating department. Here the men drive nails all day long, making the framework to protect the vehicles from damage during transit. The cars are taken apart, covered with cloth, and very carefully boxed. One vehicle was being prepared for shipment to India. A complete little house was being built for it and lined with waterproof roofing paper. Vehicles which go to this far-away country must be protected from moisture as well as from damage in transit. After crating is completed a large elevator drops the crates to the door of the cars which are waiting on the private track, and this track connects with every railroad and transportation line in the world. I have seen factories in all parts of the country, but I have never been so impressed with the system, workmanship, exactness of detail, wonderful management and large amount of work done, as in this up-to-date automobile factory, and that is saying a great deal, as it is a matter of common knowledge that the adoption of systematic methods of manufacturing has been carried to a much greater extent in the construction of American automobiles than is the case in almost any other line of industry which involves the use of such a vast amount of intricate and expensive metal-working machinery of every possible type."

CONTINENTAL MOTOR WORKS TO ENLARGE.

MUSKEGON, MICH., March 30.—If evidence to support the claim that Michigan automobile interests felt the effect of the recent slump to a comparatively small extent were needed, the fact that the Continental Motor Manufacturing Company, of this city, has just let contracts for the erection of a new machine shop to measure 110 by 175 feet, to be completed by June 1 next, should be sufficient to show that the depression has not deterred this concern from going ahead with what appears to be much-needed expansion. The building is to be one story high, of the saw-tooth roof type, and of absolutely fireproof construction throughout. The present machine-tool equipment will be housed in the new building and extensive additions and improvements will be made in the shape of automatic machine tools.

A new motor-testing house, which is also fireproof, has just been added to the facilities of the Continental plant. It is claimed to be the largest and best-equipped of its kind in the country, as its permanent equipment provides a capacity for testing 50 motors at a time. The proposed improvement, *i. e.*, the large new machine shop, is the fourth addition that the Continental company has found necessary during the two years that it has been located in Muskegon, and the reason for making it just at this time is said to be because of the fact that orders now in hand are sufficient to keep the entire plant busy for many months.

The company is now making a very complete line of motors for touring cars, commercial vehicles and special taxicab and marine types, in addition to which it has been found necessary to largely increase their output owing to the demand for motors of the automobile type for various industrial applications, such as electric lighting, ditching machines, gang-plows, lawn-mowers, etc., owing to their compactness, and a large share of this demand has been filled by Continental motors.

The Department Where the Holsmans Are Assembled.

Where the Paint Is Applied and the Finish Perfected.

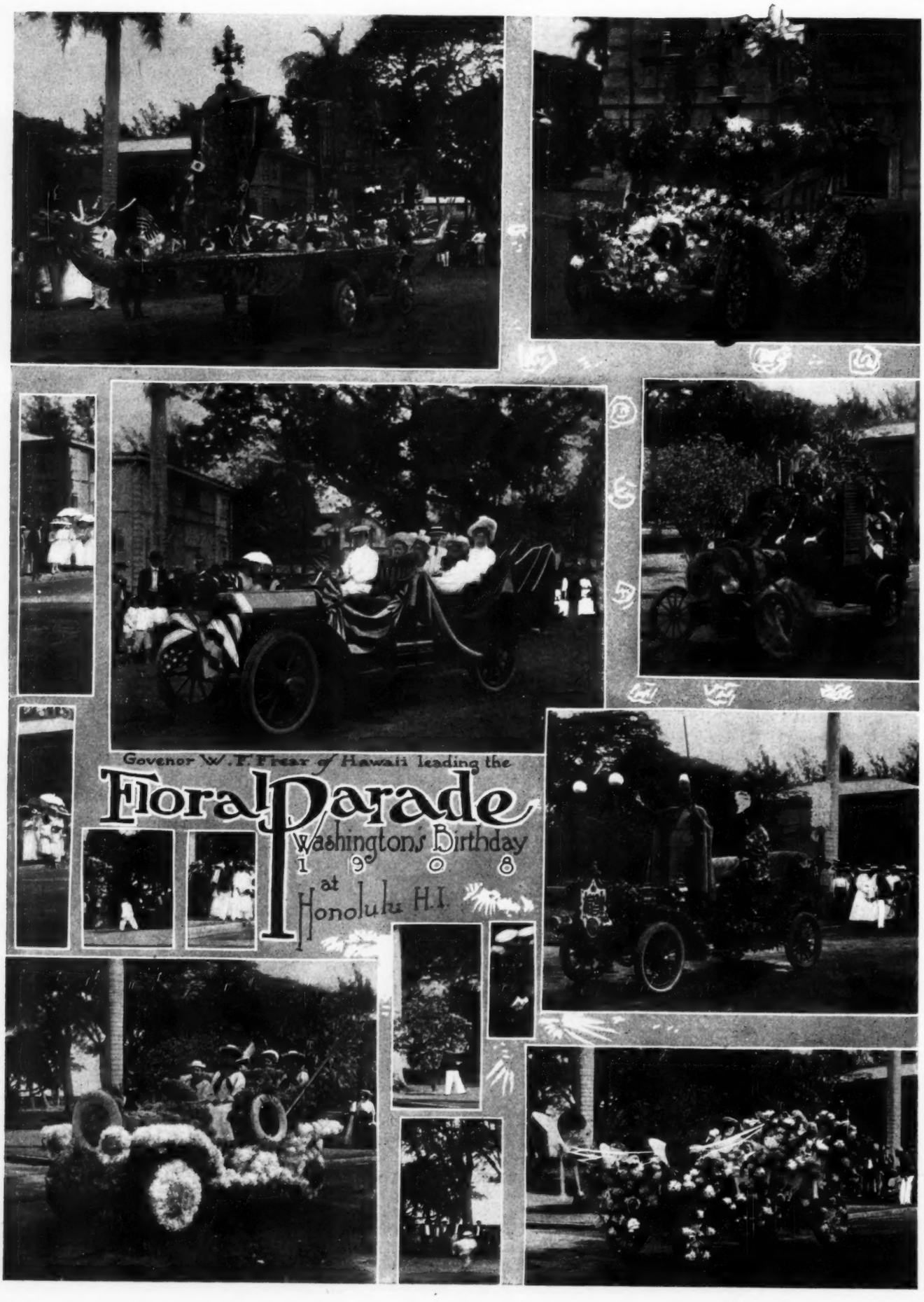
LONDONERS TAKE TO AUTOBUS VERY KINDLY

LONDON, March 23.—If any one had had the temerity to make the prophesy ten years ago, or even five, that to-day would see the streets of the world's metropolis full of machine-driven 'buses, he would have been derided. But then, no Britisher would have ever dreamed of making such an assertion. The old-time arks with their spavined and underfed motive power, which had to exert far more than the unit of energy which Watts has perpetuated, to get their load under way, were revered far too highly as a time-honored institution to be treated thus lightly. What would London be without its fleet of 'buses? Though the horse has been relegated to the limbo of forgotten things that the automobile has been responsible for banishing, and his place has been taken by a vehicle with a far greater capacity, still there seem to be more 'buses in London's streets to-day than ever there were.

A View of the Strand, Showing the Passing of the Horse 'Bus.

From one point of view, the change has been merely one from flesh and blood to iron and steel—the smell of the horse and his stable have been bartered for the odor of petrol and lubricants, and the vast number of petrol-driven 'buses that now course the streets have given the London atmosphere another and a decidedly distinctive flavor. It had enough of its own before the passing of the horse, and whether this new one is the result of a chemical combination of exhaust gases from petrol motors with those that already existed, or is merely a blend in which the characteristic odor of half-baked petroleum products is uppermost, is a question for the connoisseur to decide. Certain it is that the question is one that has agitated London and Londoners not a little. As a matter of fact, at one time it appeared as if an ultimatum would be issued by the authorities that either the smell or the 'buses would have to go. It is a most peculiar thing about the average London dweller that he never asked to have the atmosphere cleared of any of the many and sundry half-burnt products of combustion from other sources that continually fill it, nor could he distinguish any particular source of noise that afflicted his hearing unduly among the many that comprise the hum and roar of London streets until the advent of the petrol 'buses. Then it suddenly became apparent that the smoke from the exhaust of hundreds of big cars and the clash of their sliding gears were things not to be grouped in the same class with similar annoyances, and were, consequently, not to be tolerated.

Like every other innovation, the petrol 'bus had to fight its way into favor, and the rapidity with which it has done this is quite in keeping with the advance that it marks over its predecessor, for the Londoner has already come to accept the power-driven 'bus and regard it as a hallowed institution, native to the soil—much as he did the trio of straining horses and the mountain of creaking, swaying carriage work they pulled. There are now some seven to eight hundred motor 'buses in London, of which more than 600 are owned and operated by two large companies, the London General and the Vanguard. Like everything else, the motor 'bus was made the plaything of the stock speculator in its earlier days and, as a result, the Vanguard Company is overburdened with watered shares. Though the statement has been contradicted and denied as often as it has been announced in the press, it is known definitely that there is a movement afoot to amalgamate these two concerns into one corporation—a step that cannot fail to have a far-reaching and beneficial effect upon London's surface transport facilities, which are not of the best by any means.


Govenor W. F. Frear of Hawaii leading the
Floral Parade
Washington's Birthday
1908
at Honolulu H.I.

TEN YEARS AGO FIRST WINTON WAS SOLD IN CLEVELAND

TEN years ago—to be exact, Tuesday, March 24, 1898—the Winton Motor Carriage Company made its first sale of a motor carriage, and the sale was traceable directly to an advertisement.

On that morning, Robert Allison, a mechanical engineer of Port Carbon, Pa., called at the little Winton factory and asked if he might see one of the "horseless carriages" which had been advertised. "Surely," responded Mr. Winton. "And I'll give you a ride in it, too, if you like."

Mr. Winton's suggestion pleased the caller immensely, for he had just visited two places in other States where "horseless carriages" were said to be in process of making, but had been received coldly and denied even a peep at the mysterious machines.

The Winton car was scrutinized critically for an hour or more. Then a journey several miles across town was undertaken, one or two stops being made while Mr. Allison called out mechanical engineers, friends of his, to pass judgment upon the machine. Early in the afternoon, being assured that a machine could be ready for shipment to him within a week, Mr. Allison signed his name to an order and became the first American purchaser of an American-made, standard-model, self-propelled road wagon.

H. C. Sargeant, of Westfield, N. J., also a mechanical engineer, visited the plant that same afternoon and was surprised to find there his friend, Allison. Mr. Sargeant absorbed a great deal of Allison's enthusiasm and followed his lead, buying car No. 2. Thus on its first day of actual business, the Winton Company sold two machines.

The first batch of cars consisted of four machines, one of which Mr. Winton himself used. Only one of the four now remained, and this car was bought by John Moody, a manufacturer of Hamilton, Ont. This sale, made two days after the Allison and Sargeant sales, completed the output and gave the struggling Winton Company the moral and financial encouragement which ultimately resulted in the establishement of the greatest exclusive automobile factory in the world. Mr. Allison's car was shipped from Cleveland promptly on April 1. A week later the vehicles for Messrs. Sargeant and Moody were on the railroad cars.

AUTOMOBILE HAS BECOME A NECESSITY IN EVERYDAY LIFE

"WE are reaping the reward of faith," said Benjamin Briscoe, in discussing the present marked revival in the automobile business. The Maxwell factory has not laid off a man all season, but, on the contrary, has been working to capacity during the past few months of business depression, while other factories either closed down entirely or worked a short force.

"That we not only did not curtail our output, but actually increased it over our original schedule, was due to our unbounded faith in the stability of the country and of the automobile industry—at least that part of it engaged in the production of moderate priced cars—and that we have been unable to accumulate a single car against the heavy spring demand is proof that our optimism was justified. Ordinarily, we plan to produce several hundred cars over the delivery demands in the months from November to March, but this season we have been hard pressed to keep up with current orders.

"At the time when the breaking of a few banks threw some of our competitors into a fit, and pessimism was rife, I looked the situation over and came to the conclusion that that was our time to make a ten-strike. I was certain of the ultimate recovery of trade and I believed the period of depression would be short-lived. On those grounds we determined to push work in all four plants so as to have Maxwell cars ready for delivery early—a most important advantage to be gained over those of our competitors who were standing idle or undecided as to what to do. Then I figured that, as almost all other factories had canceled orders for material—indicating that they would turn out only about half as many cars as we had previously estimated they would—there would be still more room—and more demand—for Maxwells. So we increased our output 25 per cent.

"Our faith is being rewarded in a way that surpasses our fondest hopes. Our sales since August 1 show an increase of 42 per cent. over those of the same period last year and those of January, February and March surpass last year by 50 per cent. When I say sales, I mean deliveries—not merely orders. Seems as if this showing gives the lie to the too general supposition that the automobile industry is to suffer more than other branches of commerce from the temporary depression. For my part I predict that the total business of 1908 will exceed that of 1907 by greater or as great a margin as that of 1907 was in excess of the year before. In other words, I believe the automobile has become a necessity in the everyday life of every successful business and professional man, and if any additional evidence of this were necessary the constantly increasing sales should be sufficient."

FARMERS GENERALLY ARE NOT HOSTILE TO AUTOMOBILES

IT has become the fashion among some writers and not a few autoists to credit the farmer with a feeling of animosity toward the automobile. In the New York to Paris race some of the drivers complained that the "peasants," as they called them, charged exorbitant rates for the assistance rendered the snowbound machines.

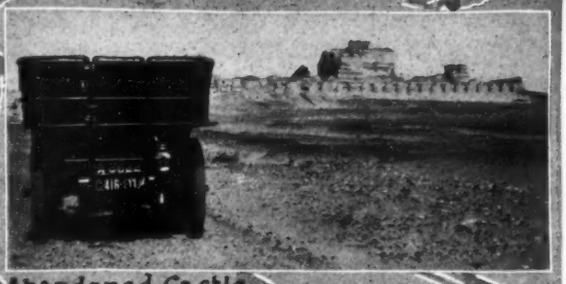
G. B. Sharpe, publicity manager for the Studebaker, stated in a recent interview that his own experience with the Studebaker Army dispatch car that made the run from New York to Fort Leavenworth, Kansas, most of the way over the same route, would lead him to an entirely different conclusion regarding the farmer's attitude. Said Mr. Sharpe:

"The farmers helped us dig through snowdrifts and brought their horses out to assist us through drifted roads where ordinarily a farmer would not think of asking his horses to go, and, considering the service rendered, I do not believe their charges were exorbitant. Furthermore many of them exhibited an enthusiasm that was, to say the least, cheering to our tired drivers and crew. All along the line our drivers reported the same kind of treatment, and nowhere were they more enthusiastically welcomed than in the great farming State of Kansas. I believe that almost invariably if the motorist will regard the farmer as a friend instead of an enemy and accord him the gentlemanly treatment which is his due the farmer will be only too glad to meet the motorist on the same footing. The selfishness of the few who thought that superior speed and power gave them the earth and all that was on it, has been the mainspring of the farmer's dislike for the automobilists as a class."

Two Ships of the Desert

Mr. Richard Croker

First Car ever on this Spot



Abandoned Castle

MR. GLIDDEN IN THE LAND OF THE PHARAOHS.

February 27, Mr. and Mrs. Charles J. Glidden completed their tour of the land of the Pharaohs, which was started on February 13. The roads of Egypt are limited but good, the longest continuous drive being 60 miles. from a point on the desert, east of Cairo, through that city to the Pyramids.

On completing his tour of Egypt, Mr. Glidden, having obtained permission from the Sultan of Turkey, proceeded to Palestine. He cables from Jerusalem that it was impossible for him to land his Napier car at Joppa, and he was obliged to proceed farther north to the port of Haifa. From that point he drove by way of Athlit, Caesarea and Joppa to Jerusalem. It was the first automobile ever seen on that route, and caused much excitement among the natives. Mr. Glidden's total mileage to March 18, on his world's tour, was 43,137 in 37 countries visited. From Jerusalem Mr. Glidden drives his car to the sea of Galilee, returning to Haifa, and sends his car from there by train to Damascus, 176 miles, driving to several places out of Damascus, and finally reaching Beirut via Balbec.

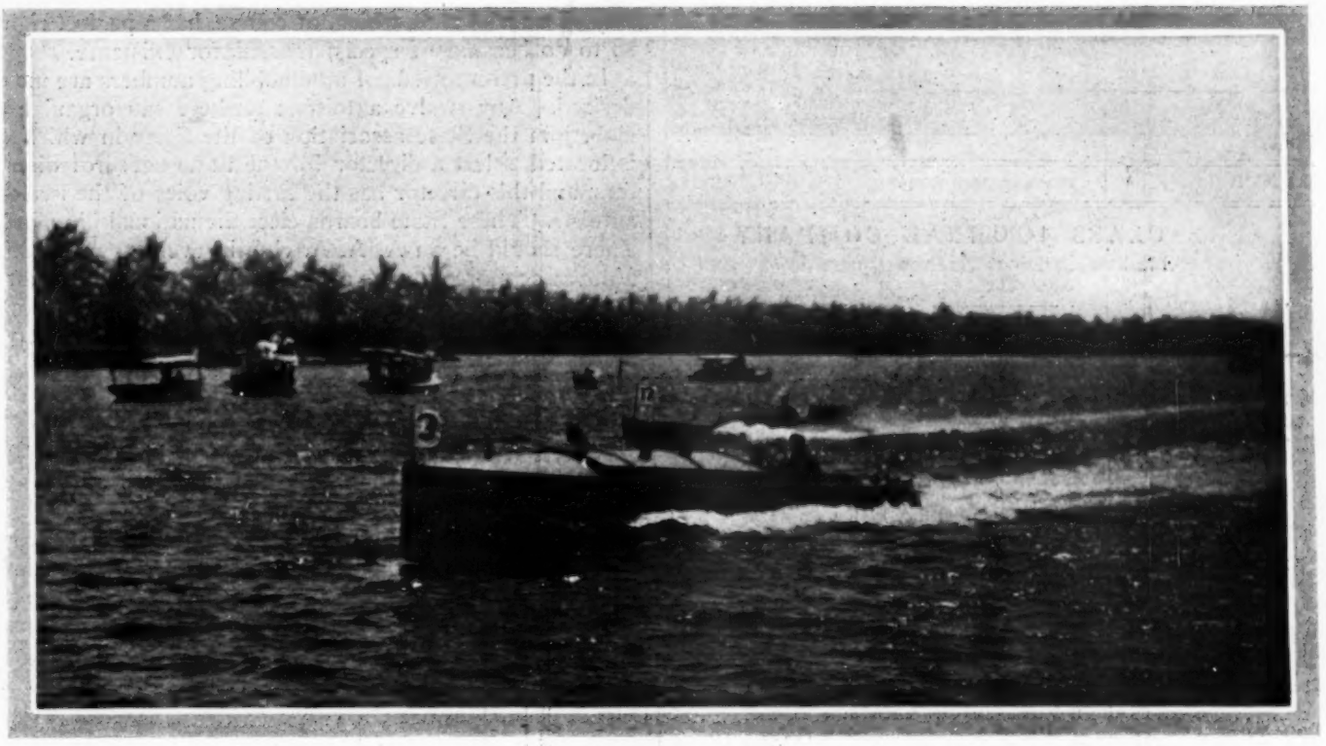
The next country visited will be Greece, followed by Montenegro, Dalmatia, Croatia, to Trieste, crossing the Dolomites, and reaching Paris early in May and London about May 15.

Pacha Hassan. H.H. Prince Aziz

An Egyptian Village

A Native Chauffeur

Soudan Police



"Dixie" Leading "General" in 41-2-Knot Race at Palm Beach, Fla.—Finish Was Two Seconds Apart.

THE PALM BEACH MOTOR BOAT RACES.

A new aspirant for motor boat racing honors, the *General*, owned by E. R. Walker, Detroit, Mich., covered itself with glory at the fourth annual regatta of the Palm Beach (Fla.) Power Boat Association, March 17-21. The *General* was four times a winner in the races, and finished twice in second place, in one of the latter events giving the *Dixie*, the international cup winner of last year, the race of its life in a 41-2-knot event on March 18. In this event the *General* was given 1 min. and 45 sec. the best of the start, and the finish, which is the subject of our illustration, was one of the closest in motor boat racing history, two seconds separating the contestants at the finish.

The *Dixie*, Commodore E. J. Schroeder's racing marvel, added the Dewar trophy shield to the collection at the Palm Beach races on March 20, by winning it for the second time, and incidentally establishing a record for the Lake Worth course of 29.728 miles per hour. The previous American record was made last September by the *Dixie* on the Hudson river course, and was 29.622 miles per hour. The *Dixie* also won the endurance reliability 18-knot contest on March 20 at Palm Beach. Motor boat racing is opening a fine field for the manufacturers of automobile engines both at home and abroad and a steady advance in development has been made since their entry into the sport.

The next motor boat races are of international interest and will be held at Monaco, April 6-13. There is a large number of entries, and with calm weather in the Mediterranean it is confidently expected that a new set of records will be established.

THE OLDEST HOUSE IN THE UNITED STATES.

A celebrated French author, referring to a very aged person, remarked that death seemed to have forgotten him and passed him by. In like manner it may be said that the furies of fire, frost and blistering sun seem to have forgotten an old house that stands in St. Augustine, Fla. It is the oldest house in the United States—built 345 years ago, in 1565—yet, with a new roof and new siding, it stands there to-day like a sturdy bit of the sixteenth century carried over into the twentieth. The house was built by French Huguenot emigrants, who came to a new world to seek the religious peace that they could not find at home. While they were rearing its walls of sea-shells and mortar, Michelangelo was building the famous dome of St. Peter's in Rome. Back across the Atlantic, the forefathers of Washington and Lincoln were living in England, unmindful of the unborn descendants who were to make their names imperishably illustrious, but in spite of their labors the religious peace that they sought came not. Instead came Spanish adventurers, who interfered with their form of worship and at length butchered them. From 1565 to 1580 the house was used as a home for the monks of St. Francis. In 1586 the English came under Sir Francis Drake, and the Spanish town was raided as the French town had been. The English and Spanish warred incessantly until 1762, during which time many houses were burned, but the little old house shown in the picture always came through intact, some way. Since 1821 the land on which the house stands has been American territory; the structure is on a quaint old street opposite the United States barracks. And, strangely enough, when this picture was taken of a sixteenth century house that had lingered over into the twentieth the two periods were also facing each other in the street—an '08 Cleveland automobile and an ancient ox-cart.

Oldest House in America, Now Used as a Garage.

THE AUTOMOBILE

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GREAT VALUE OF CLUBS TO LOCALITIES.

That automobile clubs organized and conducted for the general advancement of automobiling—unhampered by social functions except of a more or less democratic character—can accomplish great good in their localities is becoming convincingly apparent every day. Take, for instance, the present extensive signboarding plans of clubs in various parts of the country—like the Automobile Club of Philadelphia, the Chicago Motor Club, the Automobile Club of Cincinnati, the Long Island Automobile Club, and the Automobile Club of Buffalo, just to mention a few of those now busily engaged—for nothing adds more to the enjoyment of touring than the correct marking of the roads.

As the growth of autoing proceeds astoundingly, the fact is becoming more apparent that the general good is attained best by clubs not burdened with the upkeep of expensive clubhouses and wherein members are consulted in the conduct of affairs and their wishes given due consideration by those entrusted with office.

When a club becomes nothing more than a garage—like the Massachusetts Automobile Club, of Boston—its worth is confined to those who avail themselves of this feature. But it is fortunate that all clubs of the country do not similarly confine their activities to this narrow and personal field, and it follows naturally that the most substantial results are obtained by those clubs which invite to their membership all autoists who are good citizens and do not compel the rigid and undemocratic scrutiny of a social club, which, of course, has a perfect right so to do because of special reasons for existence.

In the present needs of automobiling numbers are most desired. Any twelve autoists anywhere can organize a club, join the State association of the State in which it is located, select a director for the State board of directors, and this director has the casting voice of the twelve autoists. These State boards elect the national directors. There should be an A. A. A. club in every town where a dozen or more autoists are to be found. Only by thorough organization can the needs of automobiling be successfully met. This lesson is being learned everywhere.

* * *

BRITONS TEST OUT AMERICAN METHODS.

American machinery and machine-tools have won their way, the world over, on a basis of intelligently applied systems and standards, so that the man who owns an American machine in the interior of Central Africa can send to the manufacturer for replacement parts and know that they will fit without the aid of a machine shop. Many manufacturers claim to live up to such a high standard, but numbers fall short, and, to show that his firm was in the former class, the British representative of a well-known American car, proposed a "standardization test" such as had never been attempted before with any kind of machinery.

Three Cadillacs were selected at random from stock by a committee of the Royal Automobile Club, and, after having been run fifty miles as a preliminary, were totally dismantled. From the three piles, parts were selected at random in the rebuilding process, and replacements to the extent of about 10 per cent. of the total number were requisitioned and substituted for the originals. The first car was ready to run within 7½ hours after starting, though the facilities for assembling could not be compared to those of a factory.

That each one of the cars successfully emerged from a 500-mile test at top speed immediately after this process of substitution, is one of the most striking evidences of the value of manufacturing on an interchangeable standard basis ever afforded, and speaks louder for American manufacturing methods than any amount of ink and paper possibly could.

* * *

THAT 'ROUND-THE-WORLD AUTO BATTLE.

It required the imagination of the Latin to conceive the 'round-the-world automobile endurance race, but in solving the unusual exigencies of the test the practical American is now leading the procession, first off for Alaska and the unknown difficulties that await. When the event was first proposed there were many who smiled knowingly, rating it a clever bit of advertising by *Le Matin* of Paris and the New York *Times*. Now thousands are eagerly watching the progress of the cars in the fight to overcome conditions considered impossible. School children throughout the world are having their thirst for geographical knowledge interestingly increased by an absorbing study of the globe-girdling route of the motor-driven vehicles, now being asked to do things which once would have been simply ridiculous. It must be admitted that even to those who thought the trip was barely possible, the success thus far has been a surprise.

A. M. C. M. A. PLANNING A RAILWAY SHOW ALSO

THAT there will be another show at the Grand Central Palace next winter and that the American Motor Car Manufacturers' Association will exhibit at it was practically settled on Monday. Officials of the independent organization had had a series of conferences with representatives of the Automobile Club of America. Under just what terms the association will again do business with the club has not been settled, or at any rate not been made public. There was an air, however, of beaming satisfaction upon the face of the A. M. C. M. A. committeeman, who was interrogated on the subject. In view of the well-known friction between the two over the expenses and rebates of the last show, it is safe to say that the independent manufacturers will be a bit more in the open foreground in the promotion of the next show, the regulation of its expenses and the division of its receipts.

During the course of yesterday's meeting a suggestion that the association promote a city-to-city railroad exhibition was received with so much favor that a committee was appointed to report on it at the next meeting. If the scheme goes through it will constitute an additional form of exploitation for the cars of the 52 members of the A. M. C. M. A.

The project originated with Charles E. Lewis, of the Jackson Automobile Company. In outline it calls for a train of 30 freight cars to carry the machines and a train of Pullmans for the salesmen and demonstrators. It is calculated that the trip will last three months, the duration of the stops, of course, depending on the trade importance of the cities en route.

It is proposed to make the start from Detroit, going to Cleveland, then to Buffalo, Rochester, Syracuse, Utica, and Albany. Continuing the tour the cities to be visited will include Springfield, Worcester, Boston, Providence, Hartford, New Haven, Bridgeport, New York, Newark, N. J., Atlantic City, Trenton, Philadelphia, Baltimore, Washington, Richmond, Charleston, W. Va., Pittsburgh, Columbus, Cincinnati, Indianapolis, St. Louis, Kansas City, Omaha, Des Moines, Minneapolis, St. Paul, Milwaukee, Chicago, and Detroit, all the cities en route having a population of 100,000 and over. At each it is planned to give hill climbing and other demonstrations and to participate in such tests as may be promoted by the local clubs or dealers.

At yesterday's meeting trade conditions were discussed and routine business was transacted. In attendance were H. O. Smith, Premier Motor Mfg. Co.; G. V. Rogers, Mitchell Motor Car Company; R. M. Owen, Reo Motor Car Company; C. C. Hanch, Nordyke & Marmon Co.; W. H. Van Dervoort, Moline Automobile Company; S. H. Mora, Mora Motor Car Company, and Alfred Reeves, general manager. In the absence of Benjamin Briscoe, the chairman of the committee, the chair was taken by H. O. Smith.

BROADENING OF A. A. A. TOURING BOARD'S WORK

HOW broad in scope has become the work being done for autoists by the American Automobile Association is illustrated by the information for tourists now in hand and being compiled. Speaking of the work of the touring board, and how the fact of the A. A. A. being truly national in character enables it to do what none other can, Chairman Hower says:

"It must be remembered that the touring board, besides the chairman and Secretary Lewis, has ninety members, located in as many sections of the country. During the past year, the local clubs of the American Automobile Association have been laying out routes, radiating from their respective cities, copies of which have been forwarded to the touring board office in Buffalo and by the touring board arranged in files, from which copies can be readily made on the application of members. This information could not be gathered by an individual, nor by an individual club, at any cost, but only by a body such as the American Automobile Association, by reason of the clubs affiliated with it, numbering now 126.

"Through its touring board, the A. A. A. has opened an office in Paris, at 4 bis rue Descombes, presided over by Victor Breyer. Mr. Breyer is an American, who has spent the last six years in Paris. By arrangements made through Mr. Breyer, a member of the American Automobile Association can rent a first-class car at a reasonable rate, the price covering all expenses of every description, including tires, gasoline, repairs, garage charges, chauffeur and the chauffeur's personal expenses. These arrangements can be made at the touring board offices in Buffalo, or at the secretary's office in New York, and the car selected will be at the place in Europe designated, at the time named. The touring board files contain information of all description, such as import duties, car and driver's licenses, together with routes, descriptions and conditions of roads. Arrangements have been made with the American Express Company covering the shipment of automobiles to any foreign port at a rate lower than can be obtained by any one other than A. A. A. members. All of this assistance is absolutely free to members."

E. P. CHALFANT TAKES CHARGE OF LICENSED ASSOCIATION

AT a meeting of the executive committee of the Association of Licensed Automobile Manufacturers, at the New York offices, Tuesday, March 31, specially called to take action in the matter of choosing a successor to Milton J. Budlong, who recently resigned as general manager, and who now holds the office of president of the Packard Motor Car Company of New York, E. P. Chalfant was elected to fill the vacancy, with the title of assistant general manager. April 15 his duties will begin.

Mr. Chalfant has been identified with the automobile industry for some years, being sales manager of the Waltham Mfg. Company, who are members of the Licensed Association. As a board member representing the Waltham Company, he is entirely familiar with the policies and methods of the Association. He was a member of the traffic committee of the Licensed Association and a board member of the National Association of Automobile Manufacturers. Prior to entering the automobile field, Mr. Chalfant was assistant to the president and head of the sales department of the International Tire Company. His experience in the sales end of the industry dates back some fifteen years.

When seen after the meeting to-day Mr. Chalfant said: "I have been very much interested in the work and policies of the Association ever since I became a board member, nearly four years ago. Although I have not held an executive position, I have been in close touch with things relating to the Association and the Selden patent. The general policy inaugurated by the members of the Association will not be materially changed, and I believe that the near future will develop some interesting facts as the result of the close relationship that the members have with the Association."

PEOPLE WHOSE OPINIONS ARE WORTH WHILE.

S. H. Mora, Mora Motor Car Co., Newark, N. Y.—"We are firm believers in the six-cylinder proposition's future. Our agents seem to look at it as we do; for our orders are two to one for the 'sixes' as compared with the 'fours.' To my mind the aim of construction has been to attain flexibility equal to that of the steam car. Two cylinder cars supplanted 'one lungers' and the double cylinder gave way to the quadruple. So I believe that the 'six' will supplant the 'four' at the high price end of the business. Continuously applied power is an advantage not to be disputed. We have tried to produce as light a car as is consistent with strength and average power. We are satisfied with the progress we are making; for the engine and transmission of our 'six' weigh but 15 pounds more than those of our 'four'."

H. O. Smith, Premier Motor Car Co., Indianapolis.—"Our trade opening in Indianapolis scored a far greater success than ever the most sanguine expected. The selling results of the week showed fully three cars purchased to every one sold in any week in March 1907, or, putting it in another way, the sales were equal to the business done in any three weeks in March last year. The carnival was on a more elaborate scale than the initial one last season. Among the features were various competitions of the obstacle order to show the control of the cars. We also had a successful hill climb. I was much disappointed in not getting our Premier to Savannah, but we could not spare our factory men to look after it. We shall have two or three cars in the Glidden Tour."

G. V. Rogers, Mitchell Motor Car Co., Racine Junction, Wis.—"The expansion of our factory is continuing. We have broken ground for three new concrete buildings which will bring our total floor space up to 14 acres. One is 600 by 130 feet for a paint shop; a second, 130 by 160 feet, for a shipping department; and the third, 100 by 130 feet, an addition to our main machine shop. We are making great preparations for our big reunion of agents on August 27, 28, and 29. The entertainments will run from prize fights up through the whole gamut of motor car functions. We will start day and night shifts on April 1. Business in the West is booming.

W. H. Van Dervoort, Moline Automobile Co., Moline, Ill.—"The selling season in the West has opened a month earlier than last. The demands for cars are coming to us in larger quantities than in March, 1907. This is especially true of the small towns, which everywhere have had a brisk trade. I have an idea that this is explained by the fact that the second hand cars and machines taken in exchange have been dumped into the big cities and have interfered more with the sale of new cars than have the few exchanges in the little places."

R. M. Owen, of R. M. Owen & Co., Selling Agents of the Reo.—"Things are going smoothly enough at the factory at Lansing to admit of Mr. Olds continuing his sojourn at Florida to this late spring date. Speaking as selling agent I can say that actual sales of Reos to date are ahead of last year and you must not forget how big a year 1907 was for the Reo."

C. F. Wyckoff, of Wyckoff, Church & Partridge, Eastern Selling Agents for the Stearns.—"I have just returned from visit to the factory at Cleveland, where I found the production progressing satisfactorily. While West I stopped at Chicago. The agent there reported that Stearns sales were double those of last year to date."

Milton J. Budlong, President Packard Motor Car Co., of New York.—"I am a newcomer to the Packard fold. I am amazed at the vogue the car has. Close to 1,000 cars of the 1908 output have already been shipped from the factory."

A. A. A. RACING BOARD IN SESSION.

A meeting of the A. A. A. Racing Board is to-day in session at the Association's headquarters, 437 Fifth avenue, New York City. Rules and the Vanderbilt race are under discussion.

PULLMAN IS PHILA.—SAVANNAH WINNER.

PHILADELPHIA, March 30.—At a meeting of the Contest committee of the Quaker City Motor Club, last Saturday afternoon, the protest of the Pullman people against the awarding of the honors in the recent race to Savannah to the Studebaker was sustained. The latter car arrived at the finish first by nearly 24 hours and came in for a great reception, while the Pullman was almost lost in the shuffle. The crew of the latter, however, proved that they had adhered to the course laid out before the start, while the Studebaker people, who were miles behind, left the course and cut across country to dodge the bad going; that they had lived up to the agreed-upon conditions regarding drivers staying with their cars, while the Studebaker sent in relays and shipped the worn-out man ahead by rail to get him in shape for the next relay; that their observer had stayed with the car, while the Studebaker observer was absent from the car on several occasions. In view of this testimony, which the Studebakerites failed to successfully meet, the committee spent little time in coming to a decision.

Banquet at York to the Pullmanites.

YORK, PA., April 1.—Over three hundred persons attended a banquet in this city on Saturday night, which was given by the employees of the York Motor Car Company in honor of Paul Gillette, Newark; G. W. Daley, Philadelphia; Robert Morton, York; the crew of the Pullman automobile, which won the race from Philadelphia to Savannah, and James A. Kline, general manager of the York Motor Car Company. Many of the most prominent autoists from this section of the country were present, and the function was enjoyed by all who participated. The toastmaster was W. W. Williams.

The banquet tables were arranged in a letter "P," and the dining hall was decorated with large American flags and bunting. During the evening Manager Kline read a telegram he received from the Quaker City Motor Club, which stated that the Pullman car had been awarded the race. Mr. Kline then announced that the York Motor Car Company had challenged the manufacturers of the Studebaker car to race one of their 40-horsepower machines any distance up to 1,000 miles for a purse of $5,000.

Preceding the banquet was an automobile parade, in which twenty-five of the Pullman models took part. There was a band, and each automobile was decorated. The Pullman "Swamp Angel," which won the race to Savannah, headed the procession. It was driven by Robert Morton, and, besides him, contained General Manager James A. Kline and M. H. Schuler.

E. V. CO. TO BE LEGALLY WOUND UP.

HARTFORD, Conn., March 30.—It is reported that foreclosure proceedings will be instituted in the United States Circuit Court for the district of New Jersey this week, with a view to legally winding up the affairs of the defunct Electric Vehicle Company, as it is said to be the desire of the bondholders of the company to dispose of it as a going concern to the Packard Motor Car Company of Detroit. The situation is somewhat complicated by the efforts of the Electric Storage Battery Company of Philadelphia, the largest single stockholder, which holds $6,500,000 of the paper, to reorganize the company, though its attorneys would give no information on this point.

When called upon to confirm the report of the foreclosure proceedings, the attorneys for the receiver in New Jersey, Lindabury, Depue & Falks, stated that they knew nothing of it and that an application to continue the manufacture and sale of cars from parts and material on hand, had been made to the court and granted on Monday last. Receiver Nuckols has been in Chicago during the past week, closing the branch in that city on April 1. The New York branch is to be closed on April 25. It is reputed to be the intention of the Packard company to devote the Hartford plant to the manufacture of commercial trucks, the motors of which will be built in Detroit.

CHICAGO'S CARNIVAL IN SUCCESSFUL PROGRESS

CHICAGO, March 30.—On a most pretentious scale the spring carnival of the Chicago Automobile Trade Association was inaugurated Saturday night, and to-day there is every indication that the affair will be a huge success. Every one of the stores along the row has been artistically decorated for the occasion with ferns and other potted plants; some of them have added outside decorations, and all along the street there is a carnival spirit that cannot help but enthuse dealers as well as prospective customers. In fact, every one of the sixty and more members of the trade association has entered into the spirit of the affair, and, with their shoulders to the wheel, they are pushing with a unanimity that cannot help but bring success.

A census taken of the row Saturday shows there are fifty-two representatives of car concerns participating, while there are thirteen tire concerns and eleven houses handling accessories. This, it is calculated, means the carnival is a million-dollar show, for the total list of the 216 different models on view reaches $900,000, while the tire and accessory exhibits easily add the other $100,000. This census also disclosed the fact that there are seventy-six different makes of cars on exhibition, of which number all are American-made except two, the Renault and Isotta. In this lot are several motor buggies and commercial propositions, while the motor cycle is well represented.

The carnival was opened with an illuminated parade Saturday night, and it was the grandest affair of its kind ever witnessed in Chicago. The weather man, though, had a grouch. The judges, Ira M. Cobe, John W. McKinnon, and George C. Greenburg, counted ninety-two cars in line when the parade went past the reviewing stand for the first time. All of them were not decorated, however, it being Chairman Paulman's idea to alternate an illuminated, then an undecorated car, in order that the spectators might better study the beauties of the illuminated display. It was no easy task picking the winners—there were so many beautiful designs. There were three prizes, but, in addition, it was decided that there should be ten given honorable mention. The judges' decisions were as follows:

First prize.—Thomas Flyer roadster, driven by C. A. Coey.
Second prize.—White steamer, driven by Miss Mildred Plew.
Third prize.—Woods electric, driven by Paul Frank.

Those to get honorable mention were as follows:

Apperson, driven by J. F. Gunther.
Ford roadster, driven by Robert Bartel.
Vesta battery, a Thomas-Detroit, driven by C. E. Gregory.
De Luxe, driven by E. E. Read.
Stoddard-Dayton, driven by Marshal Rapp.
Gearless, driven by H. W. Russell.
Peerless, driven by John Bonschein.
Pierce-Arrow, driven by Paul Hoffman.
Pennsylvania tires, Mason car, driven by W. D. Rockwell.
Indian motorcycle tri-car, ridden by John T. Fisher.

The awarding of first prize to Coey met with the approval of most of the critics, for the Thomas was most elaborately decorated. Coey, being president of the Aeronautique Club of Chicago, seized the opportunity to advertise the sky pilots by using an airship for his main idea. Simplicity and beauty were aimed at in the White steamer, and the judges hesitated a long time before they gave the first award to Coey. Miss Mildred Plew drove the steamer, a big White car, and was dressed in white. Carl Metzger, on the Woods electric, won third prize, his car being very expensively decorated.

SITUATION AT ALBANY IS COMPLICATED.

ALBANY, N. Y., March 31.—With the failure of the revised motor vehicle law bill to make its appearance in either house, although it was practically drawn and all but a few details agreed upon prior to the break between the New York State Automobile Association and the Automobile Club of America, there has come a decided activity in separate amendments to the existing automobile law. Those bills already in show an inclination to move, and others are being introduced.

At the session of the Senate last evening Senator Grady of the Sixteenth Kings district introduced a bill amending the motor vehicle law so as to include in the requirements for a licensed or registered chauffeur a minimum age limit of 18 years, and also the furnishing of a bond in the penal sum of $2,000 for the payment of any injury, loss, or damage resulting either to person or property by reason of the unskilful or negligent management or operation of a motor vehicle by said registered chauffeur. The bill was referred to the committee on internal affairs.

KISSEL KAR CUTS CALIFORNIA RECORDS.

News comes from Los Angeles of another victory for the Kissel Kar on the Pacific coast. After breaking the Los Angeles to Daggett record, it followed up this creditable feat the very next day by setting up new figures for a run from Los Angeles to Victorville, a distance of 105 miles in 3 hours and 50 minutes, and also from Los Angeles to San Bernardino, covering 65 miles in 2 hours 5 minutes.

DAYTON DEALERS ORGANIZE TO HOLD SHOW.

DAYTON, O., March 30.—At a meeting of the local trade, held here late last week, the Dayton Automobile Dealers' Association was formed, G. G. Peckham being elected president, and A. M. Dodds, secretary-treasurer. Plans are already under way for the holding of the first automobile show this city ever seen. It will take place at Armory Hall, April 20-26 next.

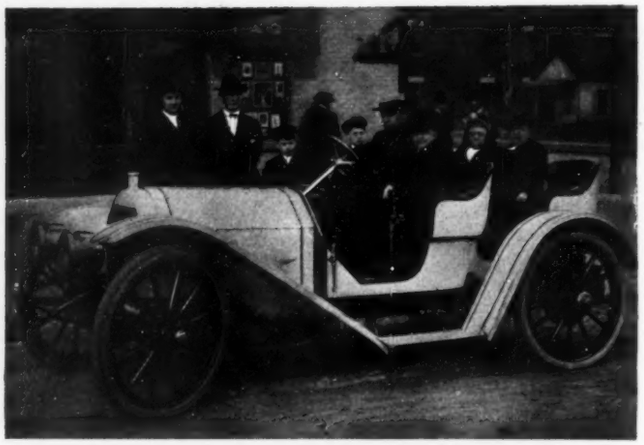
MARYLAND WILL NOW HAVE ROADS.

ANNAPOLIS, Md., March 30.—The Good Roads bill has finally passed the Legislature. It is now a law, and has been signed by Governor Crothers. The bill was passed without a dissenting vote, after an agreement had been reached with reference to the provision relating to the taxing of railroad franchises on turnpikes. In the shape it has finally passed the bill appears to satisfy every element of both parties, and the most delighted of all are the automobile clubs of Washington and the State of Maryland, including the Automobile Club of Maryland. The work the bill calls for guarantees to Maryland the best roads in the country, and in the future tourists between New York, Philadelphia, Baltimore and Washington will not have to travel through a sea of mud in passing through Maryland.

In its present form it includes the best features of the bill that Benson presented, and the men who were instrumental in bringing about the result contend that it means that $5,000,000 will be spent in this State within the next few years in building good roads and that not one cent of this amount will be taken directly from the masses. The tangle, which for a while threatened the bill, was finally straightened out by an amendment. The bill then went through both houses a-flying. The amendment regarded the United Railways franchises and turnpikes, by which the right of the city to collect the park tax in Baltimore from the company over those highways is guaranteed.

APPERSON WILL MAKE VANDERBILT ENTRY.

CHICAGO, March 30.—Edgar Apperson has announced his intention of entering an Apperson Jackrabbit in the next Vanderbilt Cup race under the colors of the Chicago Automobile Club. "If the race for the Vanderbilt Cup," said he, "is held in the vicinity of New York or at Savannah, I will enter a car in that event." This is believed here to be the first positive announcement of any American maker that he will be represented in the great American classic race on the road.



Midgets Touring the West in Their Imperial Roadster.

Count and Countess (nee Mrs. Tom Thumb) Magri and Baron Magri on their arrival at Topeka, Kan., in their Imperial car, in which they are traveling the country.

SEASON'S PACKARD OUTPUT FINISHED EARLY.

DETROIT, March 30.—In accordance with its long-established custom of making early deliveries of its product, the Packard Motor Car Company is busy to the full capacity of its immense plant, getting out the last 400 cars of its season's output. Already a thousand 1908 Packard "Thirties" have been delivered to purchasers, and the 2,000 men at work in the different departments of the factory, which covers a floor space of eleven acres, are now turning out cars at a rate which will probably complete the annual program of production on schedule time. Last season the final car was finished a month ahead of the scheduled time of delivery, and the company is anxious to be well advanced at the close of this season.

There is no long period of inactivity between seasons in the Packard factory. The production of cars of successive models is so arranged that, as one department completes its work for 1908, it picks up that for 1909. Thus the immense body-building department, which makes all of the Packard bodies, including the limousines and landaulets, naturally completes its output for the season before the assembling, painting and other finishing departments, and is one of the first to start on new work. The company's new power plant now being in operation, giving a total of 2,500 horsepower, the factory is in much better shape than ever to produce cars expeditiously.

INDIANA'S AUTO WEEK A SUCCESS.

INDIANAPOLIS, March 30.—Taken from both a commercial and an educational standpoint, the annual automobile show given here last week under the auspices of the Indianapolis Automobile Trade Association, was distinctly a success. Sales aggregating fully $400,000 were made during the week, a comparatively low estimate considering the fact that about 200 automobiles were sold. Throughout the week there was the greatest harmony between the dealers and manufacturers. All of the salesrooms were elaborately decorated, and several concerns gave neat souvenirs or arranged for some special entertainment. At the last minute the parade to have been given Monday was postponed until Wednesday afternoon, but it suffered nothing from the delay.

Tuesday several hundred persons witnessed the four-tenths of a mile climbing contest on Michigan hill near the city, which followed a short parade on downtown streets by the contestants. The timing was accomplished by a very unique device, the contesting car breaking a thread which started a stopped watch which was stopped by electricity as a second thread was broken at the top of the hill. Rules of the American Automobile Association were observed in the events. The summary follows:

Cars Listing at $1,000 or Under.

1. Buick, Buick-Losey Co., W. B. Peterson..... :48 3-5
2. Ford, Gibson Auto Co., Frank Menthorn..... :56

Cars Listing from $1,000 to $1,800.

1. Overland, H. T. Hearsey Vehicle Co., C. P. Brockaway.. :50 3-5
2. Stoddard-Dayton, Fisher Automobile Co., Guy Simmons. :51 2-5

Cars Listing from $1,800 to $2,740.

1. Stoddard-Dayton, Fisher Automobile Co., Howard Hodson :38 4-5
2. Thomas, Indiana Automobile Co., L. E. Finch..... :40 4-5

Cars Listing from $2,750 to $3,500.

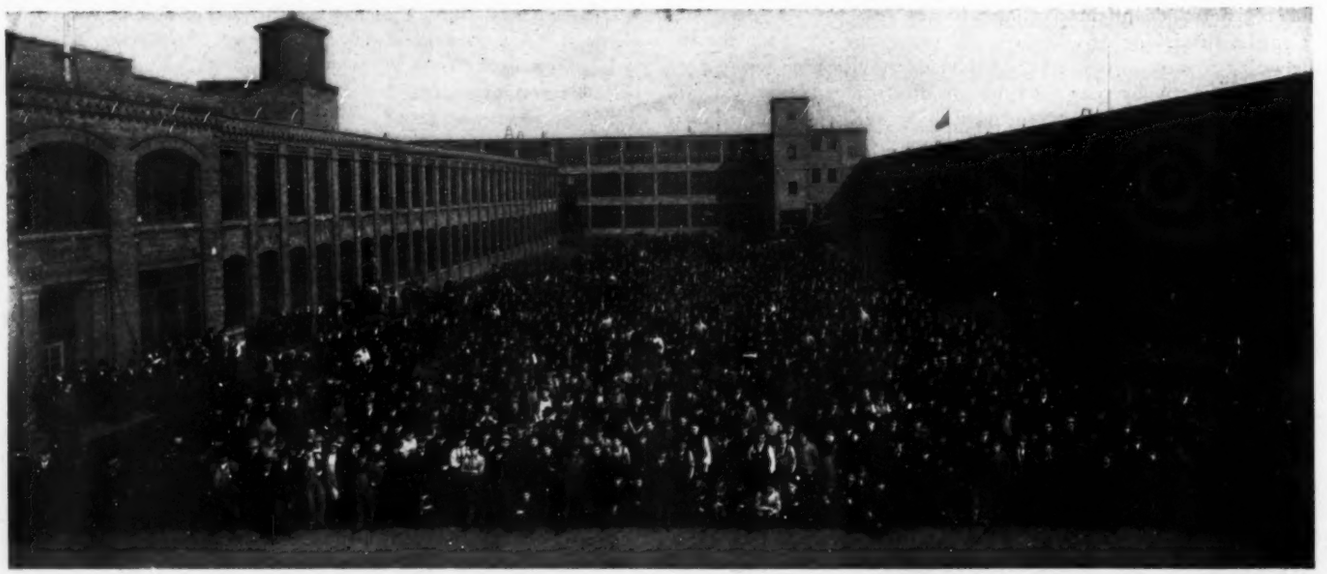
1. Stoddard-Dayton, Fisher Automobile Co., Howard Hodson :37 2-5
2. Thomas, Indiana Automobile Co., L. E. Finch..... :40 4-5

Cars Listing Above $3,500.

1. Stoddard-Dayton, Fisher Automobile Co., Howard Hodson :39
2. National, Fisher Automobile Co., Thomas Kincaid..... :39 2-5

It is estimated that fully 100,000 persons from all parts of Indiana saw the parade held Wednesday afternoon, when 226 automobiles, of which 175 were entered by local dealers and manufacturers, were shown. The others were driven by individual owners, and one of the interesting features was the first attempt in the city to show commercial vehicles on a large scale.

The week closed with a supper and smoker at the Grand Hotel beginning at 10:30 o'clock Saturday night, at which there was also a lively vaudeville entertainment. About 250 members of the trade, and their friends, attended.



Employees of the Packard Motor Car Company in One of the Courtyards of the Company's Plant at Detroit.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

The Continental Caoutchouc Company has offered $1,000 in prizes to the finishers in top places in the Briarcliff race whose cars are fitted with Continental tires.

The Atlantic Motor Car Company, agents for the Stoddard-Dayton, with headquarters at 1776 Broadway, are the latest to expand, having been compelled to lease the adjoining store, thus doubling the size of their salesroom.

The Michelin Tire Company has confirmed its offer of cash prizes to successful contenders in the Briarcliff race equipped with its product. The prizes for entrants are: $500 for first, $350 second, $200 third, $150 fourth, $75 fifth, with like prizes for the drivers of the cars.

By way of winding up the affairs of the bankrupt Dragon Motor Car Company, successor to the Dragon Automobile Company, the receivers will offer in April at public auction at the factory in Philadelphia the assets of the company. Included among them are said to be some seventy Dragon touring car chassis.

It is interesting to note that while pessimistic reports occasionally crop out regarding the automobile trade in general the actual facts of the case belie the opinion of the pessimists. The Bosch Magneto Company reports that it sold during the week ending March 14, 4,970 magnetos and that it is over 1,000 machines behind in its orders.

Unlike the Vanderbilt Cup course, there are not many places on the Briarcliff course from which an unobstructed view of the course can be obtained. A grand stand is being erected at the East View turn, which gives a clear view of the course for a half mile in each direction. Information concerning tickets for this stand can be had of Koenig Brothers, Tarrytown, N. Y.

Evidences of the scale on which the recently reorganized Wayne Automobile Company, Detroit, Mich., is planning to turn out cars are to be seen in its order for $200,000 worth of machinery, most of it designed by W. E. Flanders, general manager, who, with President B. F. Everett, have been given carte blanche by Messrs. Palms and Book, the backers of the concern.

The New Departure Manufacturing Company, Bristol, Conn., recently received a strong testimonial letter from Apperson Brothers, of Kokomo, Ind., regarding the very satisfactory performance of the New Departure annular ball-bearings, which were used in the winning Apperson at Savannah, Ga. These bearings will form part of the regular equipment of all the Apperson cars turned out during 1908.

Cartier, Chapman & Company, Ludington, Mich., report that business is better than it ever has been in the history of the concern. They are the makers of the Breeze windshields, and the improvements recently added to their line have created a demand that is bringing them orders from all parts of the country. The company states that it has not had occasion to lay off a single mechanic or lose an hour's time throughout the past winter.

"According to figures compiled by the American Motor Car Manufacturers' Association, it is apparent that enthusiasm has been rekindled with the coming of spring," says F. P. Brand, president of the Imperial Motor Car Company. "The registrations at Albany have been unusually heavy this month—751 cars having been registered in New York State during the first three weeks of March. I believe 1908 will witness the breaking of all automobile sales records."

An incident which marks an epoch in the automobile industry was the shipment of the first car from the new Maxwell factory at Newcastle, Ind., last week. From now, each Maxwell plant will devote itself exclusively to the manufacture of but one model in its entirety —the light runabout being made at Pawtucket, R. I., the four-cylinder, 28-horsepower touring car at Tarrytown, and the two-cylinder Model "H" roadster and touring car at Newcastle, Ind.

"The recent Boston show brought us the best business we have ever had from an automobile show," said B. A. Becker of the Elmore Manufacturing Company, Clyde, O. "The public would be very much surprised to learn how well-posted auto purchasers are becoming on the question of the two-cycle cars," he added. "The simplicity of this type of motor, together with the low cost of maintenance, are such strong points that the Elmore factory is unable to keep up with the demand."

The touring bureau of the White Company, Cleveland, O., has just compiled the sixth in the series of White route books. The new issue covers the route from Philadelphia west over the National highway, as far as Springfield, O., and then southward as far as Savannah. It gives the first definite data published on the roads of Kentucky, Tennessee, Alabama and Georgia, with directions for following the National highway through Maryland, Pennsylvania, West Virginia and Ohio, which are given for the first time with accuracy and in detail. No less than 1,800 miles of road are covered, beside which there are numerous illustrations, a double-page map and articles descriptive of the route. Copies may be obtained gratis on application to the White Company or any of its numerous branches, or to the White touring bureau at 1402 Broadway, New York.

RECENT BUSINESS CHANGES.

The R. E. Hardy Company, manufacturers of Sta-Rite spark plugs, has moved from 86 Watts street to 25 West Forty-second street, New York City.

The Auto Tire Company, of Kansas City, Mo., has removed to its new location, 605-607 Fifteenth street, that city, where a new tire repair plant, said to be one of the most complete in the West, has been installed. Victor Nelson is the proprietor, and the concern carries a full line of Morgan & Wright tires, for which it is general agent.

John H. MacAlman, for the past two years manager of the Columbia Motor Vehicle Company, Boston, has taken a lease of the Columbia salesroom and repair shop on Stanhope street, that city, and will continue business under his own name. He will continue to handle Columbia cars, having been assured of a supply from the Hartford factory, and may later take on some other line in addition. Mr. MacAlman is president of the Boston Automobile Dealers' Association and one of the best known tradesmen in the New England States.

NEW AGENCIES ESTABLISHED.

The French Manufacturing Company, Waterbury, Conn., who make a full line of seamless tubing for automobile use, are now turning their attention to lighting tubing, of which they will make a specialty.

The Curtis-Hawkins Company, the Motor Mart, Boston, has just secured the agency of the Speedwell cars for that territory. The Speedwell is a comparatively newcomer and is made in Dayton, O.

George H. Lowe has just closed a contract with the makers of the Imperial Roadster, the Imperial Motor Car Company, of Williamsport, Pa., to handle it in Boston and vicinity during the coming season.

The Butte Novelty Works, Butte, Mont., have just taken on the Franklin line for 1908. They also handle the White steamer. The Warren Automobile Garage, Warren, Pa., which also handles the Franklin, is now owned entirely by D. M. Jackson, the firm formerly being Jackson & Cross. It is said that applications for the Franklin sales agency have been received at the rate of eight per day since March 1.

PERSONAL TRADE MENTION.

General Manager S. A. Miles, of the N. A. A. M., who is touring abroad, has completed a run of over 400 miles in Wales.

J. H. Baer, designer of the Buffalo carbureter, has been on a trip visiting the Eastern trade. The National Sales Corporation, 296 Broadway, New York, is the factory sales agent for this make of carbureter.

W. B. Hurlburt and C. R. Teaboldt, manager and secretary of the Garford Motor Car Company of New York, have been constant visitors at the factory at Elyria, pushing deliveries of Garford cars for the Eastern market. A large number of orders have been booked.

J. F. Somers, formerly with the automobile department of Brown, Thompson & Company, Hartford, Conn., has been engaged as manager of the Post & Lester Company's retail branch store, situated at 175 Asylum street, in the same city, and has already taken up his new duties.

Charles M. Steele, who has been conducting an active publicity campaign for the H. H. Franklin Manufacturing Company, Syracuse, N. Y., has resigned that position to take a similar post with the E. R. Thomas Detroit Company, Detroit, Mich., and his prolific pen will shortly be devoted to the heralding of the many achievements of the Thomas "Forty."

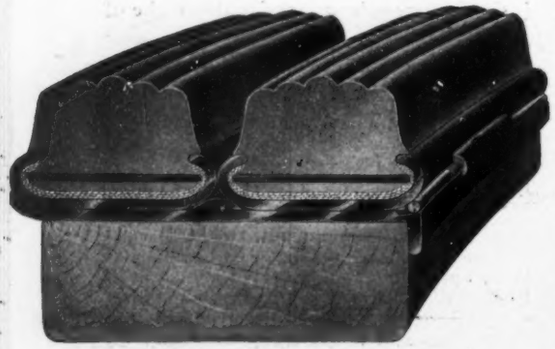
INFORMATION FOR AUTO USERS

"Upthrow-Cushion" Springs.—This is an ingenious and simple device recently placed on the market by the Thomas Spring Works, Canisteo, N. Y., and is designed to prevent the breakage of leaf-springs by "upthrow." As will be noted from the accompanying illustration, the complete device consists of a special form of coiled spring, adapted to be clamped

UPTHROW CUSHION SPRINGS.

on the axle and strapped to the frame, though two styles are made permitting them to be attached either under, or over, the axle. Four comprise a set, in order to protect each one of the springs of the car. Perfect freedom of spring action is allowed on the downward movement, but the Upthrow-cushion comes into play as soon as the upward thrust of the body rises above the normal and the coil springs then begin to resist, softly but surely. The straps shown are designed to be attached to a forged hanger bolted to the frame inside near the bottom. These straps are drawn taut and buckled after the car has its normal load aboard, and after that do not need to be disturbed.

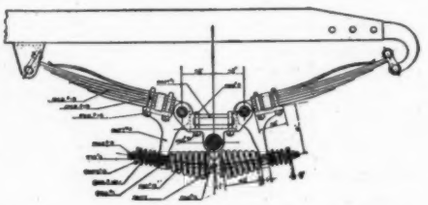
Swinehart Detachable Solids.—Great pains and study have been devoted to the perfection of detachable devices for pneumatic tires, but up to recently this has not been the case with the solid tire for commercial use, though the loss of a tire means more to the owner of an automobile truck than it does to the autoist who drives for pleasure alone. To supply this



SECTION SWINEHART DETACHABLE RIM.

demand, the Swinehart Clincher Tire & Rim Company, Akron, O., have just brought out a detachable and demountable tire and rim, and a rim retainer, on which patents are now pending. A truck equipped with these devices need never be placed out of commission to await the fitting of a new tire to one of its wheels, as a tire already mounted on a rim may be had and applied within twenty minutes, so that there need be no delay worth speaking of. The locking device not only secures the rim laterally, but it also wedges it tightly on to the retainer so that there can be no play between the rim and the rim retainer. The endless wire connected with the right and left-hand threaded turnbuckle can be loosened in less than half a minute; it can also be removed, reapplied and tightened up in about the same time. The method of mounting this new Swinehart rim and tire is clearly shown in the cut.

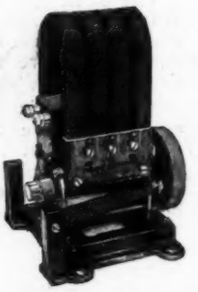
Koehler's Universal Auto Spring.—From the very start, auto makers have adopted the old-time carriage types of springs, and no attempt has been made to depart from these time-tried designs, although it has been apparent that the suspension of an automobile required something different. Hence, the shock-absorber. But this new device, which is made by the Universal Auto Spring Company, Broadway and Branch street, St. Louis, Mo., is complete in itself and requires no supplementary devices. As will be seen from the illustration, a section, of about 8 inches, is cut out of the center of the half-elliptic spring, or the lower



DETAILS KOEHLER'S UNIVERSAL SPRING.

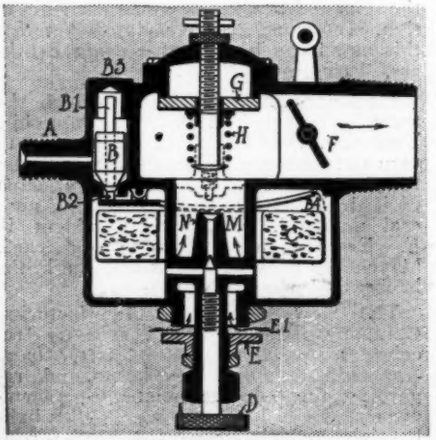
member, where a full elliptic is used. A fulcrum bracket is then placed in the same relative position on the spring seat, as shown, directly over the axle, while fulcrumed to this bracket is a drop-forged steel arm, called the spring equalizer. To these equalizers, on the upper part, are fastened the ends of the quarter elliptic springs, and, on the lower ends, between the two equalizers, is placed a barrel-shaped compression spring, beside two coil-springs of smaller dimensions on the opposite side from the compression spring. The last-named spring is adjustable to fit the height of the body, the adjustment being made through the equalizer member. This combination of balanced forces effectively prevents all shocks and jars from being transmitted to the body or mechanism of the car, as they are entirely absorbed in the springs.

K-W Magneto.—Though the K-W magneto has now been on the market less than two years, the makers—The K-W Ignition Company, 34 Power avenue, Cleveland, O., report that the demand for it is increasing so rapidly that they have become compelled to increase their facilities for manufacturing, and have also had to add to their working force. An improvement has been made in the friction drive used on this year's model of the magneto, the face of the friction wheel having been made twice as wide as formerly. It is built up of a number of rings of chrome-tanned leather, making it oil-proof, and according to the makers this type of friction wheel will give as positive a drive as a chain or gear. The K-W type of magneto occupies a unique position in the ignition field, as it is the only one of its kind that does not have to be positively driven in order to give good service. It is intended principally as a substitute for the battery and is employed in connection with the usual vibrator coils. The current generated is known as a "sine wave" current, in contrast with the usual high peaked wave alternating current, thus making its output of a uniform value above a certain speed which permits of the operation of the magneto by means of a friction drive or belt, without interfering with the synchronism of the ignition sparking. The magneto is of the inductor alternator type, thus having no moving wires, or brushes, which make it extremely simple.



K-W MAGNETO.

Oberdorfer Carbureter.—This is a new representative of the concentric float carbureter, and is being made and marketed by the M. L. Oberdorfer Brass Company, Syracuse, N. Y. It is provided with central air-opening, auxiliary air-valve, and has usual adjustments for needle valve of the spray nozzle to regulate the flow of fuel from the float chamber. The method of adjusting the tension of the auxiliary air-valve spring is by means of a screw, as shown, and this, as well as the other adjustments, with the exception of the gasoline feed valve *B*, may be made from the outside without disturbing any other parts. To adjust *B*, the cover *B3* must be removed and the valve lifted out. The cone *B* can be driven up or down its stem, to increase or diminish the part of the stem *B2*, which bears on the top of the lever *B4*, arching over the upper part of the



SECTIONAL VIEW OBERDORFER CARBURETER.

float *C*. The length of the arms of the lever *B4* is such that the rise and fall of the needle *B* is just half that of the float *C*. The normal air supply enters as shown by the arrows *E1*, the size of the opening being varied by raising, or lowering, the regulator *E* and locking it in place. The needle valve *D* does not rise to the tip of the nozzle *N*, thus retaining a small quantity of gasoline in the hollow between the tip and the opening of the nozzle, to facilitate starting. The auxiliary air-valve *G*, with its spring H, is of the conventional type, as is also the butterfly throttle *F*.